FLORIDA WILDLIFE®

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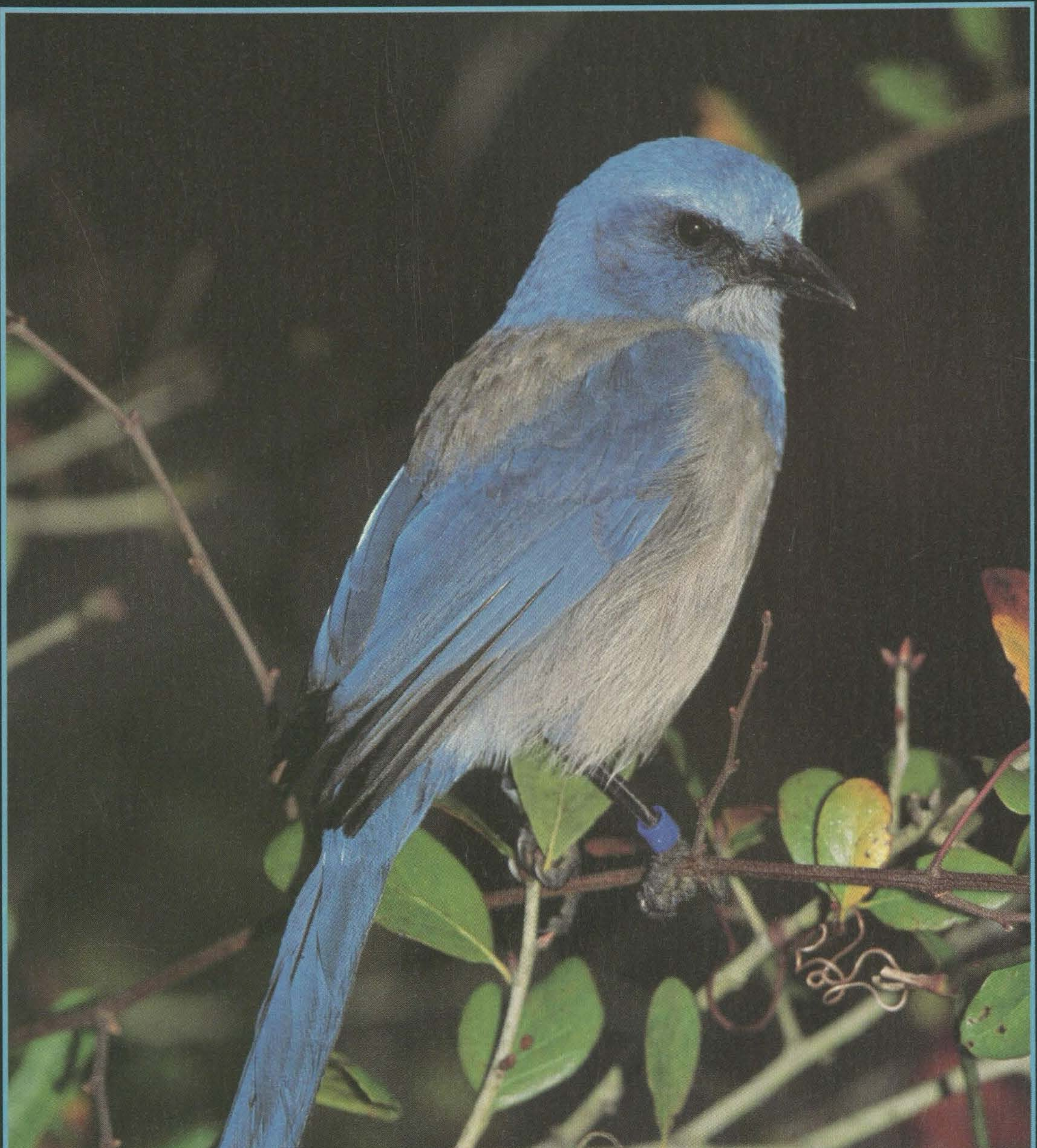


Scrub – Florida's Oldest Wild Lands

May 1, 1994

"ALL GOOD THINGS MUST COME TO AN END."

And so it is with FLORIDA WILDLIFE magazine's subscription rates. Due to rising costs and lack of adequate funding, the magazine must increase subscription rates.

Our primary business is publishing FLORIDA WILDLIFE to promote the enjoyment of outdoor recreation and educate our readers to the need for sound management of our state's wildlife and related natural resources.

The fact is, our subscription rates haven't changed since 1983 and, although we've been happy to accommodate our devoted readership by absorbing the major costs of publication, practicality must prevail.

The rate increase is scheduled to go into effect October 1, 1994, and the new rates will be $10, $19, and $27 for our 1-, 2-, and 3-year subscriptions.

To help us reach our goal of a continued high standard of quality publication and to help meet expenses, FLORIDA WILDLIFE will streamline the operation, take advantage of press and production economies, and offer a new and exciting redesigned 32-page all-color format.

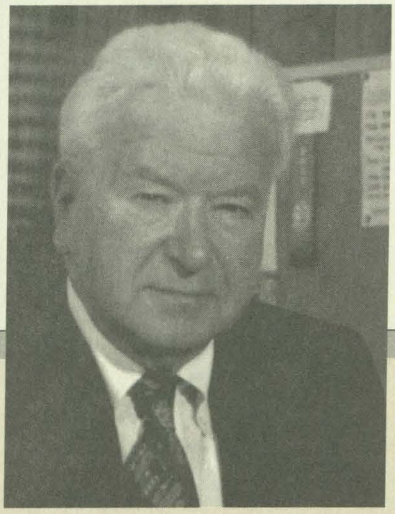
FLORIDA WILDLIFE is the only magazine covering the issues shaping our unique biological heritage. The Florida Game and Fresh Water Fish Commission is the steward of Florida's environmental resources. FLORIDA WILDLIFE continues to be one of the informational instruments of the Florida Game and Fresh Water Fish Commission.

In the meantime, take advantage of the old rates by using the subscription envelope in this issue. You can help us, help yourself and help Florida by sharing FLORIDA WILDLIFE with your friends, neighbors and relatives.

Sincerely yours,

Dick Sublette

Dick Sublette
Editor



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The Florida scrub lizard is one of the unique species that inhabit the dry and sandy Florida scrub, which is featured in this issue as the first of a three-part series on upland forests. Articles begin on page 9.

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Acknowledgements

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Covers

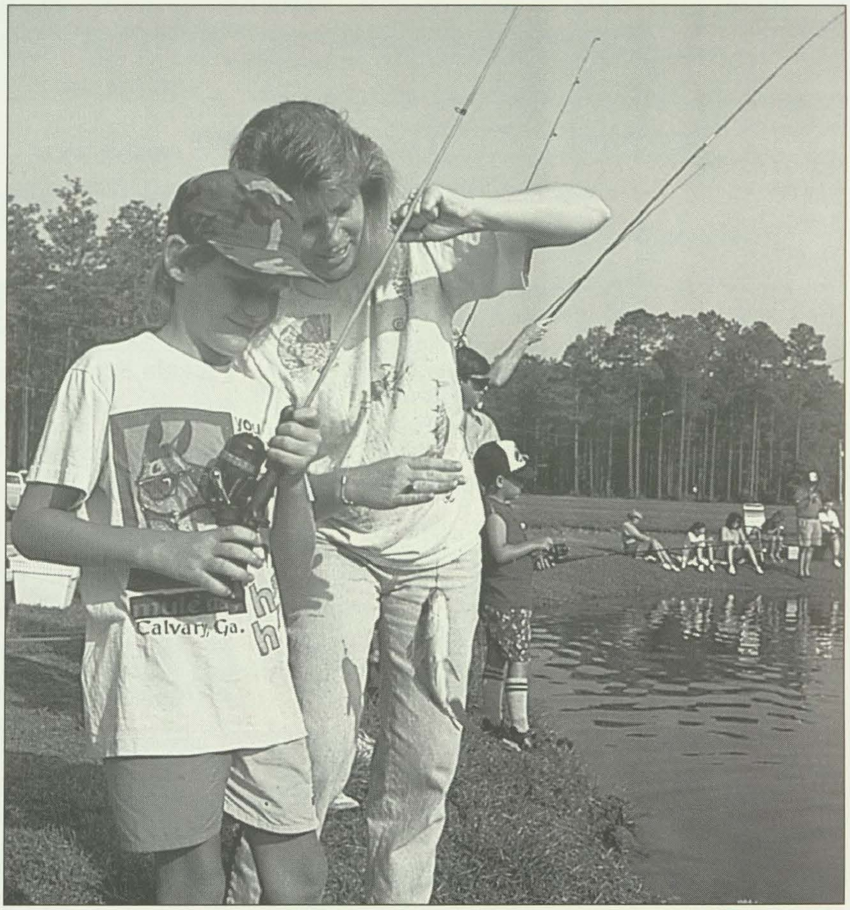
The front cover depicts a scrub jay by Lynn M. Stone. The milkweed pod by Billy B. Boothe, Jr. on the back cover received an honorable mention in our photo contest. See winners, pages 24-28.

Printed on recycled paper.

During National Fishing Week June 6-12, planned Commission events and free fishing days lure novice anglers into the excitement of the sport. Taking a youngster helps determine...

The Future of Fishing

By Gray Bass and Scott Hardin



STAN KIRKLAND

Nothing portrays Americana better than a child fishing. The portrait has changed with the times, however. The idyllic straw hat, toe-tied line and meandering river are now replaced with bream-busters and pushbutton reels, ponds set in a background of offices, and youngsters decked out in city clothes.

The future of fishing in Florida increasingly belongs to urban residents, young and old. It is indeed fortunate that many ideal fishing locations abound within the confines of our larger metropolitan areas. Although the fishing potential of these ponds has been largely overlooked by city dwellers, the Game and Fresh Water Fish Commission has taken an aggressive role in intensively managing these ponds. Working with local parks and recreation departments and volunteer groups, the Commission's Urban Pond Projects have laid the waterworks for the next generation of Florida anglers. Now children in Jacksonville, Orlando, Tampa-St. Petersburg and West Palm Beach-Ft. Lauderdale-Miami have well-stocked ponds within their reach.

One of the most important elements of a child's first fishing trip is the need to catch something. Nothing compares to the excitement of a child's hooking, fighting and landing that initial flipping, flopping fish. Once they pull in a live one, it is they who are hooked – on fishing.

Managing smaller lakes and ponds to withstand heavy fishing pressure, yet consistently satisfy impatient novice anglers, requires constant fish management. Historically, these "put-and-take" fisheries have been maintained by stocking channel catfish from Commission hatcheries. Catfish are great fun on the end of a cane pole or bream buster, but an even more cooperative fish has the potential to delight young anglers. This new success story starts at the Commission hatchery at the Blackwater Fisheries Research and Development Center.

Nestled in the Blackwater State Forest, the Research and Development Center raises striped bass and sunshine bass (white bass/striped bass hybrids) for stocking into public lakes and rivers. Sunshine bass have been stocked throughout Florida for 20 years, producing exciting sport fisheries. Although most are stocked at a length of 2-3 inches, the hatchery also produces "advanced fingerlings" (8- to 10-inch sunshines) in order to study the survival of larger fish in some Panhandle rivers. A half-pound sunshine bass is a voracious feeder and makes an attractive target for the beginning angler.

In the spring of 1992, the fishery

decided to showcase its fish-raising expertise in a kids fishing event during National Fishing Week. Using a half-acre pond normally used to culture fish, the Center stocked sunshine bass and channel catfish, feeding artificial food daily until the fish reached catchable size. The event was scheduled for the Saturday of National Fishing Week. As an optimistic precaution, all participants were required to pre-register for the event to avoid overcrowding. To their surprise, fisheries biologists at the Center were turning away applicants before opening day, even though Blackwater is 30 miles away from Pensacola, the largest nearby city.

That Saturday 180 children, ages 1 to 13, caught 569 fish. Encouraged by the success of the affair, the Blackwater folks decided to do it again in 1993, this time scheduling two Saturdays for fishing. The results were equally impressive: 235 children caught 1,130 fish, an average of about five per child.

Many of the kids caught their first fish that day. Some landed stringers of hybrids and catfish as long as they were tall. Virtually all had a whopper of a good time. One young lady, age 2, was seen petting her freshly landed fish as it flipped on the bank. All of the proud anglers packed their catches in iced coolers and carted them home, where they presumably provided many a fish fry.

Each child received a Certificate of Participation and some related literature. The Commission-sponsored coloring booklet "Kids Fishing – It's Catching On" was very popular. At the second event, Center personnel used an instant camera to photograph each child and their catch. With the color photo in hand, the new angler's experience was unforgettable.

The success of this event has contributed to the Commission's use of these hatchery-raised sunshine bass in sponsoring kids fishing elsewhere in Florida. To learn about activities planned for National Fishing Week, call your regional office of the Commission (see page 48). In addition, June 11 and 12 have been named Free Fishing Days. Although a license is never required of children under 16, on those two days even adults can fish Florida's fresh waters without a license. A combination of eager sunshine bass and enthusiastic youngsters should pave the way for the next generation of anglers – the future of fishing.

Gray Bass is director of the Commission's Blackwater Fisheries Research and Development Center near Holt. Scott Hardin is a fisheries biologist in the Tallahassee office, and a writer.

Taking a Kid Fishing

A child's first fish can be equally rewarding for both of you. However, a few tips are in order to get the most out of this experience.

- Don't plan for a full day of fishing. Unless the fish are biting relentlessly, youngsters will grow bored quickly. If they put down their rods after a few minutes, that's ok. If you fish for two hours, you've done well.

- Leave your rod and reel at home. You may think you can fish, but your best bet is to fish with your child's equipment when he or she gets bored.

- Temper your expectations. A small fish for you may be a monster for a little person. Have your camera in the right position and your child's first fish will be a record-breaker.

- Be patient. There are many things to see and do around a pond that have nothing to do with fishing. Let them do it all.

- Remember it's their fishing trip, and that will be good enough for both of you!

Learning to Hunt

By Mary A. Sumner
Illustrated by Peggy Perkerson

As a child growing up on a farm outside of Dothan, Ala., I often thought the world was passing me by. On the farm there were many chores and responsibilities. Town was 20 miles away and a great adventure when I was allowed to tag along for the purchase of some needed farm item. If you were good and kept quiet while the grownups conducted business, you were sometimes rewarded a Dr. Pepper and a package of peanut butter crackers on these trips.

I don't want to give anyone the impression that we were poor; on the contrary, we had all the basic things. We had electricity, indoor plumbing and good clothes purchased with profits from the last successful harvest of peanuts or cotton. But we lacked things that as an adult I have grown to accept as necessary – carpet on the floor, central heating and air conditioning, color television, a VCR, a microwave oven.

A visit from my grandparents, Mema and Gran, was a wonderful diversion from what I considered a boring life on the farm. My grandfather was especially fond of me, as I was his baby daughter's first-born. He would always bring some special treat and spend a lot of time walking with me, telling stories of his adventurous childhood in the early 1900s in Manatee County, Fla.

As I grew older, I was allowed occasionally to visit my grandparents who lived in north Florida, between Monticello and Tallahassee. As you might imagine, I looked forward to these trips. Gran would usually take time off from work and plan a special adventure for us. After my 11th birthday he agreed to take me along on one of his hunting trips. During the 1940s, he was caretaker and game warden of a large private quail plantation. So, you might imagine, my grandfather's hunting trips were not anything like the ones most people take today.

For weeks prior to the actual hunt day, Gran would walk an area observing animal sign and trails.

For weeks prior to the actual hunt day, Gran would walk an area observing animal sign and trails. By the time he was ready to take his trip, he had selected a prime spot.

He woke me before daybreak the morning of our hunt. As I sleepily tossed down eggs, toast and hot chocolate, I anxiously wondered what the trip would be like. After breakfast we pulled on extra clothes and heavy coats to keep us warm in the damp, November air. When we were ready to depart, Gran checked his gear and shotgun, and said, "It's time to go." I was puzzled. "Where's my gun, Gran?" I asked. With a serious face he replied, "Before you learn to kill you must learn to be a good hunter." I was crushed.

Through the remaining darkness, we silently rode in his old International Scout. When we arrived at our destination I tried to hide my disappointment by listening intently to his instructions. In the dark and on into the early morning mist we walked. After a time the front of my pants legs became uncomfortably damp from the moisture off the branches and shrubs. I began to feel cold and miserable. I was supposed to be hunting but had no gun.

We walked for what seemed like forever. Finally we came to the edge of a clearing, and Gran chose a spot above a small, low area between some hills with a slight breeze in our face. He spoke in a low voice, "We'll wait here. Their trails lead through that marsh. He continued, "With the wind in our faces they won't be able to smell us. If they do, they won't come out."

I looked out over the clearing, unable to see much because of the remaining darkness. After awhile the clearing began to lighten until I could almost see the other side. As the sun cut through the trees, the rays danced across the dew on the grasses and a faint steam rose.

"Do you see how green and new ▷

kerson '94

the grasses look?" he asked. "This marsh was burned a couple of months ago. Since then the rain has caused the grasses and marsh plants to spring up," he explained. "The deer have been grazing here. Be very still and quiet." He watched the opening as if he expected a deer to appear magically. I looked but couldn't see any animals at all, much less a deer. I was getting colder by the minute, and to make matters worse, my bladder was sending signals that it needed to be emptied soon.

Then Gran touched my arm. I looked up and he motioned slightly with his head. As I turned, I caught a glimpse of something. I strained to see. It was a deer! It had carefully made its way out into the clearing to graze and drink from standing water there. "Why doesn't Gran shoot?" I thought. Speaking slowly and in a low voice, he said, "It's a doe. She's come out to see if it is safe for the others." I looked again. The deer had no antlers; it was a female. I knew it was against the law to shoot her.

A few moments earlier I had not thought to look for the telltale sign of a doe. The lesson about becoming a good hunter first was beginning to hit home. I watched more intently. "Over to your left by the big magnolia tree," Gran said after a few moments, "Watch there." I took my eyes from the doe, which gazed toward the magnolia, and saw two smaller deer cautiously venture from the darkness of the hammock. The doe occasionally tossed her nose into the air to smell for danger while the two spotless young, unaware of potential danger, playfully crossed to their mother. I shifted my balance to ease my increasing discomfort. The doe suddenly raised her head and looked right at me. "Be still," Gran commanded in a whisper. The doe threw her head up again and after a few moments seemed to relax, eyeing the magnolia again. The yearlings alternately romped and ate the tender marsh grasses. Then he appeared.

The buck was massive. Proudly he stepped from the darkness into the clearing, throwing his head around and pounding one front hoof into the moist ground. Carefully he edged into the clearing, stopping occasionally to look around and snort. Unlike the doe and yearlings, his breath forcefully exited his nostrils like two steam vents. Slowly the sun's rays fell across his massive rack and I counted 12 points.

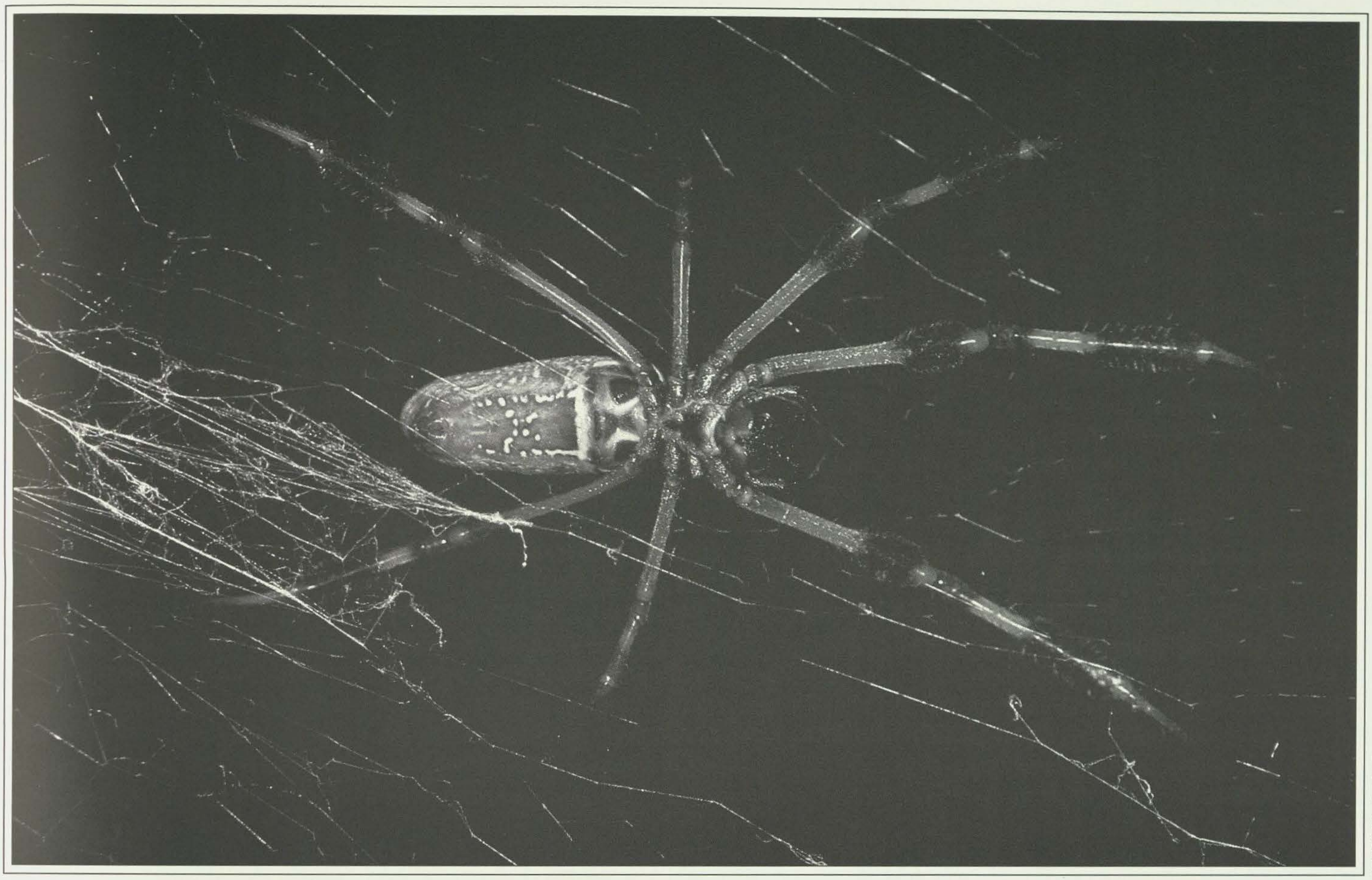
I was beside myself with excitement. From listening to my grandfather's stories, I knew this sight was a rare occurrence in Florida. I looked up at Gran who watched the buck intently. Why didn't he shoot? I had become increasingly uncomfortable, my bladder crying for release. I shifted again and accidentally brushed against a dead palmetto frond. That did it. White tails flagged as the deer leapt toward the safety of the thick hammock.

I knew Gran would be upset, but he wasn't. I quickly capitalized on this, informing him that I was extremely sorry for making the noise that scared the deer away. He smiled and said, "That's all right, I couldn't get a clean shot anyway. I'd have needed my rifle." Remembering that he had picked up his shotgun that morning instead of his prized rifle, I was puzzled momentarily.

As we hiked back to the Scout, Gran pointed out edible berries and other interesting facts about the woods. That day we also completed my first compass reading, and on later trips I learned what to pack for a hunt, how to read animal sign, trails and tracks, and ultimately, gun care and safety.

I have often thought back to my first hunting adventure. In a way, the lessons my grandfather taught me and the appreciation for the native woodlands he inspired within me are responsible for my career choice in environmental law enforcement. Long ago I realized why Gran carried his shotgun that day, instead of the rifle. It was more important to him to teach me the ethics, fundamentals and safety of hunting than to bag a trophy deer.

Mary Sumner is a law enforcement officer along the Withlacoochee and General Van Fleet state trails in central Florida.



BARRY MANSEL

The Golden Silk Spider

By Jim Strayer

"Look at the size of that spider web!"

It is summer, and the golden silk spiders (*Nephila clavipes*) have spread their threads across trees and telephone lines. They are gigantic, beautiful architectural structures. These magnificent webs that usually measure over a meter across call attention to the golden silk spider, which, although not the largest spider found in Florida, is among the most noticed. Almost always webs can be found close enough to the ground to be seen easily.

All spiders have some things in common. They have eight walking legs, a pair of smaller leg-like pedipalps near the mouth, and two body divisions (the cephalothorax and abdomen). All have fangs, and produce silk, but only 10 percent of Florida spiders weave webs. Except for a few species, the female spider is much larger than the male.

Sometimes called the calico spider or, incorrectly, the banana spider, the golden silk spider is one of the easiest to observe because of its size. The female usually has a body length of 25 mm (1 inch), while the male is about 3 mm long. Often found sitting near the orb's center, the female has a long, narrow, yellow-brown body with contrasting spots along the sides. Black tufts of "hair" band the first, second and fourth pairs of her long legs. The male looks much like the female, but is tiny and more drab. *Nephila* males live one year, or until they become mature. The female lives longer since it takes more molts, or shedding of the external skeleton, to reach maturity and attain her large size.

Venture close to a web that is eye level, and you may see, near the outer edge of the web, the smaller, less brightly colored male. Look carefully– another species of spider (*Argyodes*) that is about the same size as the male ▷

golden silk spider will live in the web as well. It feeds on its host's small prey. It usually has a cone-shaped, silver-colored abdomen that easily distinguishes it from the male golden silk spider.

Nephila have a primitive but very successful courtship. The male meets the female at the center of the web and ties her legs down, then uses his pedipalps and front legs in tactile courtship before he attempts to mate. The tying is, of course, simply an instinctive ritual; the female could easily break the tiny silk strands. Mating is risky business for most males, but for the male golden silk spider it means the end of his life.

Here's why. As with all spiders, the pedipalps of the male have bulb-like ends, while the pedipalps of the female are rounded or pointed. (These structures are easily seen with the aid of a hand lens.) A long projection on the male's pedipalps breaks off during the mating process. He mates once, at which time his usefulness to the species is over and he soon dies. The female, too, cannot mate again, but will produce eggs until she dies several months or even a year later. For spiders, maturity means death.

The female does not protect her egg cocoons as well as many spiders; she simply hides them under a nearby leaf, close to the web. When the young emerge, they do what all spiders do; they spin a long silk thread which acts as a balloon, and they are carried by the wind to a new environment, sometimes many miles away. The female young can stop almost anywhere and construct a web, but the male must be lucky enough to land very near a female and the protection of her web, or he will surely be eaten by some other critter. Until they have established a territory and begun to feed, they are called spiderlings. Once mature, the spider will not move very far from the site it has chosen.

The golden silk spider is considered a tropical spider, and if the winter is mild, may keep to its web all winter. Because it lives in subtropical Florida, it has special problems with the weather. In the summer it must protect itself from too much sun and in the winter it must get all of the sun it can. Webs are usually oriented in a east-west direction to gather the most direct sunlight in winter. In the summer the spider simply turns her body so the sun does not hit her directly.

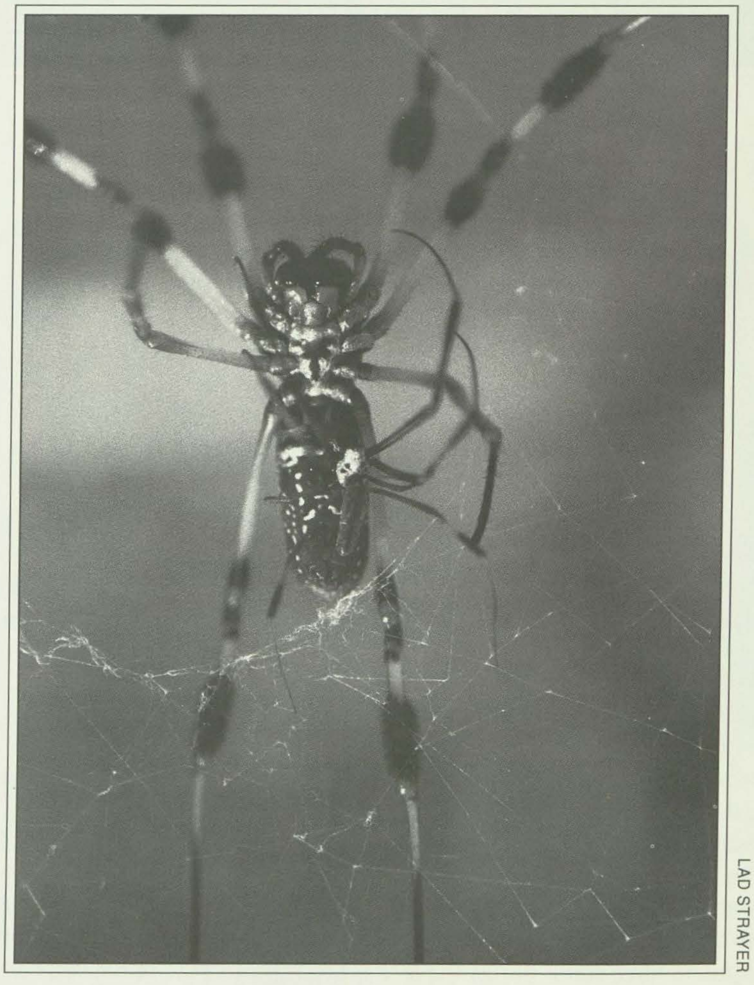
This spider has always been of interest economically because its golden-colored silk is so strong. Natives of the South Sea islands still use it to make fish nets. In one venture, entrepreneurs tried to use the silk as a commercial product because it possesses some qualities that outweigh those of silkworm moths, but because the spiders live mostly on insects, it turned out to be an impossible chore to feed the worker spiders profitably.

In order to see its color, the web must be viewed from the side, or taken down and twisted. The webs are strongest and brightest during the summer. In winter, they are usually damaged and dull.

Take a walk in any of Florida's natural areas. Though well over 100,000 spiders per acre will surround you, you may not see most of them. Instead, look for large webs and identify the golden silk spider. Observe its behavior. If you return at night, it is quite easy to see *Nephila* repairing her web. She works only on half of the web at a time, and if you leave the flashlight on for only 10-15 seconds at a time she will usually continue working.

After the lovely web attracts you, the behavior of the golden silk spider will intrigue you. Watch for them!

Jim Strayer, a retired biology instructor, is a natural history lecturer who lives in Ormond by the Sea.



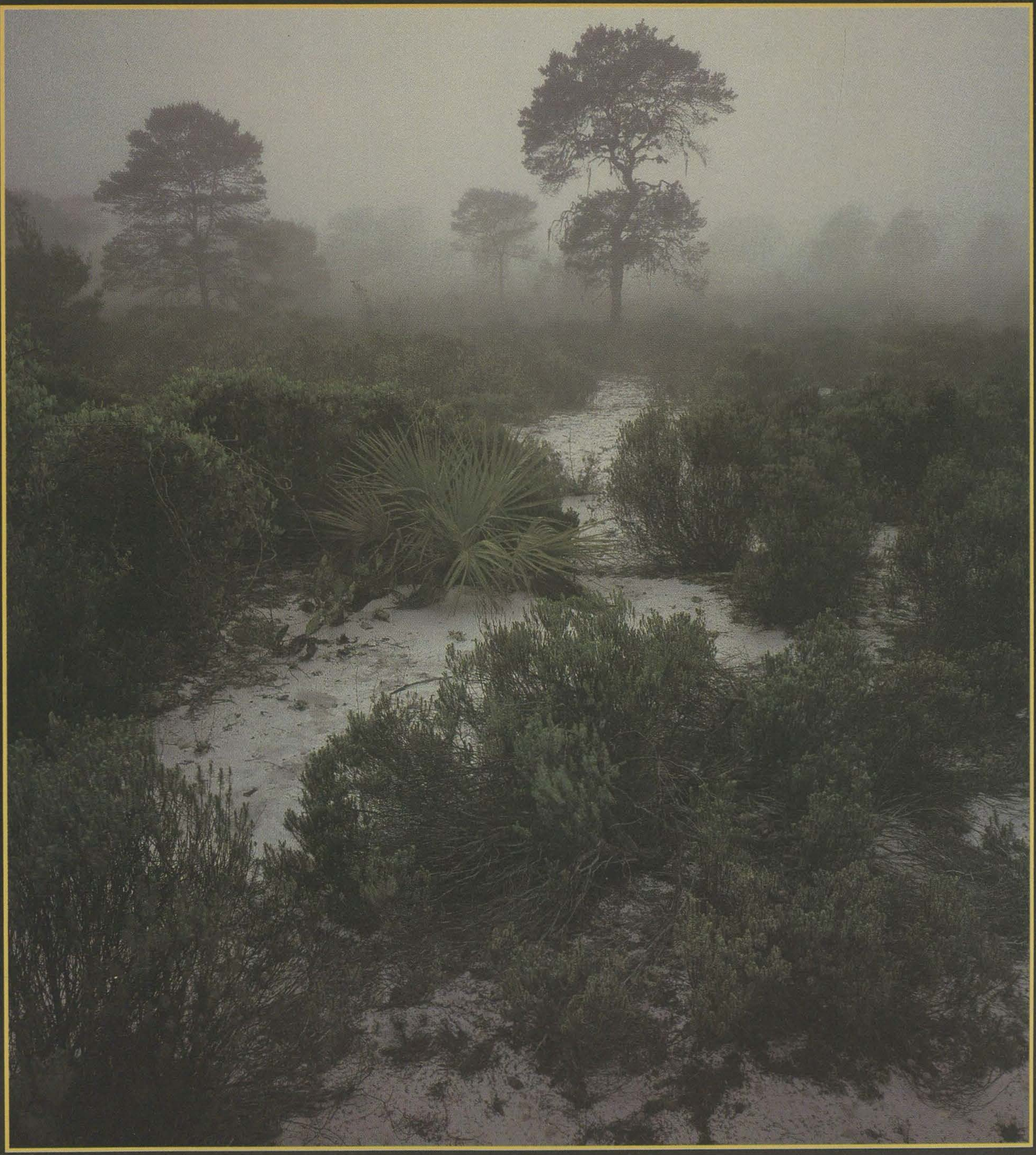
LAD STRAYER

Mating ritual of the golden silk spider.

Florida Uplands

By D. Bruce Means, Ph.D.

The following story on Florida's scrub habitats continues a series of articles exploring the state's major native ecosystems. Three previous articles dealt with wetlands. We now turn to uplands – dry land environments and the principal places we humans live, grow our foodstuffs and carry out our daily lives.



JAMES VALENTINE

Florida Scrub

By D. Bruce Means, Ph.D.

One of Florida's leading naturalists carries us into the heart of the endangered Florida scrub, an ancient wild land of white sand, inpenetrable shrub thickets, twisted sand pines, and a host of Florida's rarest plants and animals.

The new day creeps upon me as calls of the rufous-sided towhee fill the moist, pre-sunrise air. The whine of a mosquito grows in my left ear and stops. I feel it touch down on my forehead. What in the world are mosquitoes doing in scrub, Florida's driest habitat, anyway? I must be half a mile from the nearest water. Slap! I miss the darn mosquito and hurt my eye, but my frustration (and reinforcement troops of mosquitoes) awakens me.

Squinting upward, I am greeted by the vision of wispy, twisted boles of 50-year-old sand pines and their feathery needled canopy overhead. The crowns of dozens of trees make a tapestry of semi-oval shapes. None of the edges touches another crown. A river of clear blue sky about two feet wide flows between all the crowns. I wonder why there is such an unoccupied free space up where the trees have struggled all their lives for domination. A few gusts stir the treetops and an answer comes. It must be the wind, jostling branches together, that keeps the ribbon of space free from incursive growth.

It's an unusually warm March morning in Ocala National Forest's Big Scrub, the world's largest patch of this unique habitat. My bed was a carpet of gray, egg-shaped lichens commonly known as reindeer moss. A 2-inch duff of sand pine litter added extra cushion, but still I had to dig a hip-hole. In last night's dark, I chose for my bedroom a small opening in a sea of wiry-limbed brush, which in the dawn's light I recognize as myrtle oak, the most abundant plant of the shrub zone. Myrtle oak is also the most characteristic plant in all the scrub communities in Florida, with distinctive broad, oval or elliptic leaves that are shiny and slick on both upper and lower surfaces.

Looking around, I see other woody plants that together characterize "scrub," and give their name to it because they are, well, scrubby. Beside last night's headrest grows Florida rosemary, a dark green beach ball of a plant with numerous short leaves that remind me of spruce needles. Two other low-growing oaks are visible, though not so common as myrtle oak: sand live oak, with very stiff, strongly cupped leaves having a dull, light-gray undersurface, and Chapman's oak, a scraggly shrub with oblong leaves that are about twice as large as the leaves of the myrtle oak. Completing my quick survey of the conspicuous plants around me, I see saw palmetto, whose saw-toothed petioles rasp at the shins, and tall shrubs of rusty lyonia, named for its hairy, rust-colored underleaves, scattered about.

All of these plants are found together in most scrubs, which are principally vegetations of coastlines, inhabiting the sandy backdunes of barrier islands, spits and seashores from Virginia to Texas. Florida's scrubs, however, are unusual for two reasons. First, many, if not most, of Florida's scrubs occur with the wispy sand pine, whose geographic distribution barely reaches outside Florida to southwestern Alabama. Second, the interior of central peninsular Florida may hold more scrub than the coastlines.

The interior scrubs, however, do not break the rule of coastal association. Down the spine of central Florida, a series of highlands have been isolated from each other by high stands of the ocean. Inland scrubs today mark ancient shorelines and sandy deposits created when seas were higher. As the global climate grew colder, the polar ice cap froze enough seawater to expose the Florida land mass. When the Pleistocene seas receded, a ridge of relict coastal scrub habitats was left stranded. The largest of these ancient islands are found in Ocala National Forest's Big Scrub and on the Lake Wales Ridge in Polk and Highlands counties.

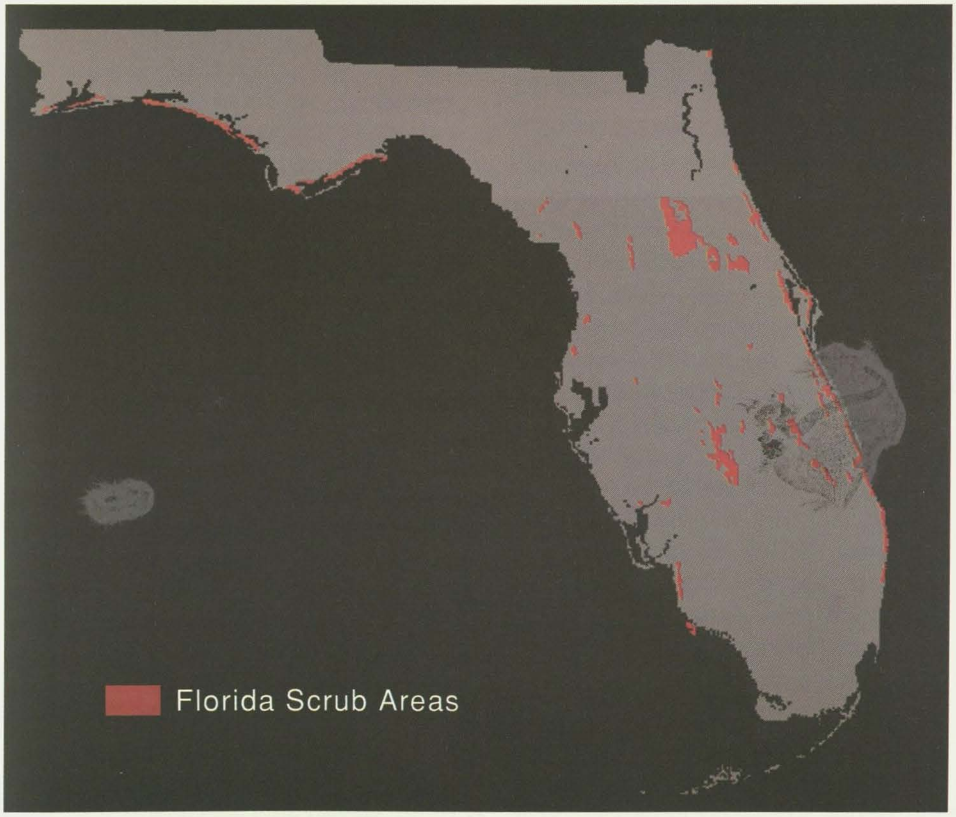
Interior scrubs today are no less insular than they were when separated by salt water. Today they are surrounded by habitats occupied by other plant communities. The one difference is in seed dispersal between interior scrub islands, which may be more difficult now, through alien terrestrial habitats, than when seawater was their only obstacle.

What I Found

I came to the Big Scrub to sample in one place as much as possible of the essence of scrubs. I was not disappointed. As the sun waxed and I rattled around in the bed of my old pickup for breakfast, nature came to me out of an adjacent clear-cut – scrub jays, an

D. BRUCE MEANS

Old growth sand pine forest in St. Joseph State Park, a coastal scrub in the Florida Panhandle.



JIM COX

extended family of them, eight birds altogether. They perched quietly in a 6-foot high myrtle oak bush, watching me curiously. While stalking the scrub jays, I had a bit of luck. I kicked over a decaying log and spotted what looked like a whirling dervish of an earthworm underneath. It was a crowned snake, common inhabitant of peninsular Florida's pine forests, trying frantically to spiral down into the soft sand. This reminded me of the Florida scrub lizard and the rarely encountered and threatened sand skink, both of which I looked for all day either sunning on logs (scrub lizard), or hiding beneath them (sand skink), to no avail. Both reptiles are confined to scrub habitats, and neither are found in the coastal scrubs of the Panhandle where I live.

I wanted total immersion in scrub, away from roads and people, so I hiked the Florida Trail about two miles south of state Route 40. After passing through a cabbage palm hammock edging a small marsh, the trail as- ▷

cended into nice examples of sand pine scrub. I walked casually, keeping my eyes to the ground after nearly stepping on a coral snake in the hammock. I soon became aware of plentiful mounds of rust-colored sand, about a teacup in volume, and strangely lumpy. On close inspection I noted that the lumps were cylinders, about the diameter of my pinky finger, of sand grains that had been compressed together when the sand was wet. These were the "push-ups" of a species of large scarab beetle, endemic to the Big Scrub. This beetle digs burrows up to 3 meters deep, proper explanation for the mounds so large you would never guess they were the tailings of an insect.

The Secrets of Mounds

Sand at the surface of the ground in the Ocala National Forest is pure white. Orangish mounds of it, scattered about in neat little piles, indicate that animals have been moving subsurface sand, which has not had its iron content leached out by rains, to the top of the ground in the process of excavating burrows. These eye-catching mounds reveal a surprising number of below-ground animals in the Big Scrub.

I began to examine mounds closely to determine how many different kinds I could find. Mounds of the imported fire ant are familiar to most Floridians, but if you're not sure a particular mound was created by fire ants, any disturbance of its surface will clinch your identification. If you're not immediately attacked by a swarm of stinging hymenopterans, you may have kicked the mound of the pocket gopher, a fist-sized rodent with strong digging paws and pockets in its cheeks for storing food. The pocket gopher is a common inhabitant of scrub and other pinelands.

You can tell if a mound is the workings of the pocket gopher by looking to see if it is one of several mounds equally spaced in a row. The pocket gopher digs a long, horizontal tunnel system located about 30 inches under the surface. As it tunnels, it must have a place to throw its excavated dirt, or the tunnel behind it fills with mining leftovers. Periodically, then, the pocket gopher must push its diggings in the only direction where there is room for excess dirt – toward the surface of the ground.

The large piles of sand excavated by the gopher tortoise are easy to identify by their large size and the characteristically wider-than-high burrow entrance. I carry a small pocket mirror with me to inspect the interior of tortoise burrows with reflected sunlight. Most of the burrows made a left or right turn and I saw no occupants, but in one burrow I spied a tortoise facing me about three feet down. The gopher tortoise, like the pocket gopher, is abundant in Florida scrub habitat, but by no means restricted to it, living in any open canopy pine forest or grassland.

Can we as Floridians find the means to save what's left of Florida's oldest wild lands and the creatures that live there?

Wherever it is found, however, the gopher tortoise is very important to other animals because its burrow offers sanctuary from extremes of heat and cold, and from fire and predators. Had I made a systematic search I could have discovered in the tortoise burrows of the Big Scrub dozens of other species of animals ranging from the large indigo snake and eastern diamondback rattlesnake, to the medium-sized gopher frog, Florida mouse and pine snake, to tiny insects that are dependent upon the dung in the bottom of the burrow. One study has summarized over 100 species of animals throughout the range of the tortoise to use their burrows.

The last kind of mound I saw was about the size of a dinner plate and looked like a tiny version of the gopher tortoise burrow, but with a quarter-sized round hole marking the entrance to a subterranean passageway. These were the burrows of the oldfield mouse.

A relative, the Florida mouse, the mammal most closely associated with scrub habitats, also lives and excavates burrows in sand pine scrub. It is not uncommon for the entrance of the burrow of the Florida mouse to open into the tunnel of the gopher tortoise.

To anyone walking here, the mounds are so abundant that they cannot go unnoticed. Even the introduced armadillo makes large burrows, quite similar to those of the gopher tortoise. So many burrowing animals are no doubt important in returning nutrients to ground surface in the excessively well-drained, sterile soils that typify Florida's scrub habitats. One way to sense animals is to identify all the kinds of burrows you can find. In coastal scrubs, look for the burrows of the ghost crab, whose eight feet make a distinctive track in the sand.

A Need for Fire

Later, driving on Forest Road 65 north of state Route 40, I rounded a bend and was startled to see a whole forest of dead, blackened, standing trees. I jumped out of the pickup, ecstatic to find this stand of 50-year-old sand pines in the process of recycling, and explored the burn for a couple of hours.

In the past century, biologists have come a long way toward understanding the natural role that fire plays in many ecosystems around the world. Sand pine scrub is known as a pyrogenic ecosystem. In the long absence of fire, sand pine forests thin out as the relatively short-lived (75-100 years) sand pine dies. Shade-tolerant hardwood trees slowly invade the site and eventually grow tall and close the canopy with their crowns, shading to death any young replacement sand pines. Too much fire, on the other hand, kills young sand pines before they can produce cones and seed. Periodic fires (every 10 to 100 years) in the interior Florida sand pine scrub habitats seem about the right frequency for the persistence of sand pine forests.

Reason? Sand pine is specially adapted for replacing itself after catastrophic fires. Its seeds are carried in unopened cones that cling to the branches of the tree for years. Intense heat causes the bracts of these "serotinous" cones to open, scattering seed on the bare, nutrient-enriched soil exposed by fire. In this way, sand pine forests replace themselves naturally, explaining why all their trees are of the same age and approximate diameter.

A number of interesting ecological observations fascinated me. I could see that, after only eight months since the wildfire, the sand pine scrub was on the way to recovery. Everywhere I looked the surface of the ground was carpeted with myriad tiny sand pine seedlings. From the clumps of dead sticks that marked the locations of scrub oaks and other shrubs, I saw new, green-leaved stems growing vigorously. The shrubs were all alive and thriving. Only their aerial portions had been killed in the blaze; the root crowns were resprouting to restore the shrub component of the habitat much more quickly than the sand pines would restore their dominance. (Many animals of the scrub – including the scrub jay, gopher tortoise, lizards and the Florida mouse – prefer the habitat in early stages of recovery following fire.)

Amid dead standing trees and stems of burned shrubs black with charcoal, I saw abundant signs of life, not death. My eye was captivated by the brilliant greens of the resprouting shrubs and the new fronds of two dwarf palms prominent in the Big Scrub, saw palmetto and *Sabal etonia*. Orangish mounds of burrowing animals polka-dotted the black ground, indicating that fire had little negative effect on subterranean life.

Leaves and litter of scrub oaks and other shrubs are not so flammable. Even sand pine straw does not burn nearly so well as the dead needles of longleaf and slash pine, trees of forests often adjacent to sand pine scrub. Biologists believe that fires in the flammable longleaf pine forests eventually ignite sand pine scrub, but only when conditions are conducive for fires in scrub – during severe drought, high temperatures, low humidity and high winds. Then the fire is so hot that it races through the crown of sand pine in a truly catastrophic event.

D. BRUCE MEANS

A downy woodpecker peeks out of its cavity in a dead sand pine, Ocala National Forest.

What's Left

Enchanting as it is, Florida scrub, one of the rarest and most endangered ecosystems in all of North America, is disappearing. Because the old dune land of the interior is high and dry, it has been a favorite choice for residential development and citrus agriculture. Only about 10 percent of the original scrub habitat of the central ridge (home to four threatened animals and no fewer than 33 endemic plant species that are listed or under review for listing) remains in its native condition. Though younger geologically, coastal scrub is in as much trouble for two reasons: we started with less, and the remaining scrub there suffers more development pressure. Can we as Floridians find the means to save what's left of Florida's oldest wild lands, and the creatures that live there?

D. Bruce Means, Ph.D. is an ecologist, and the founder and director of the Coastal Plains Institute.

Florida's Scrub Jays

By Jeff Ripple

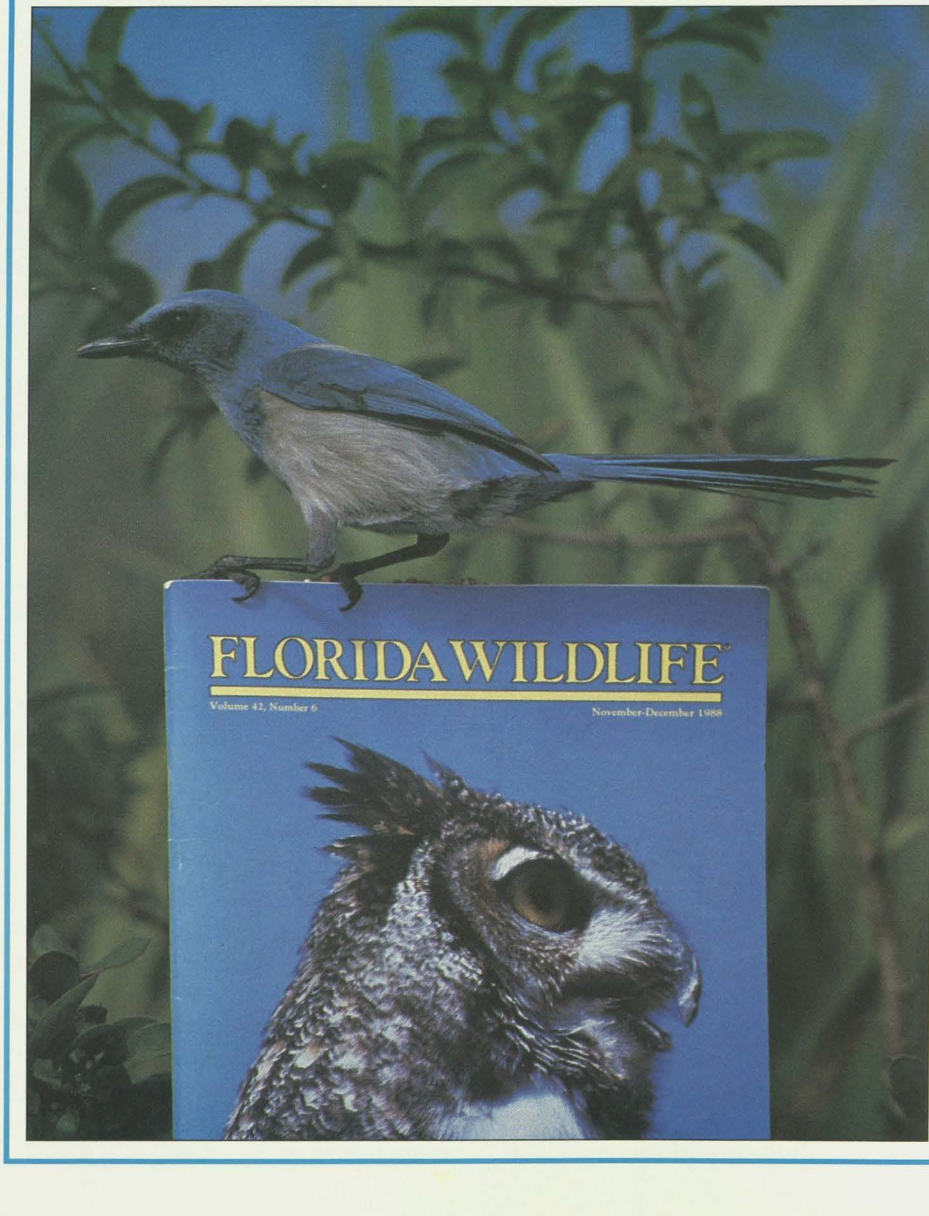
Florida scrub jays, a federally threatened species, are restricted to the arid, low-growing oak scrub of peninsular Florida. Much of the bird's habitat, considered one of the rarest and most distinctive communities in North America, has been lost to agriculture and development. As a direct result, biologists estimate that the Florida scrub jay population has declined by 50 percent in the last 100 years.

Although Florida scrub jays are similar in size and shape to blue jays, their plumage is a more-subtle blue that grades to pale gray on the back and belly. A white eye-line merges with a frosted white forehead (which is blue in western subspecies), and the striped throat and upper breast are set off by a blue necklace. Their stubby wings, long tail and strong feet indicate a preference for life near the ground. Males and females cannot be distinguished from one another by their plumage, but juveniles less than 5 months old can be identified easily by a dusky brown head and neck.

Florida scrub jays generally forage on or near the ground, close to the dense cover of scrub oaks. Like other jays, their broad diet includes insects, spiders, tree frogs, lizards, small snakes, berries and seeds. Their primary food, however, is acorns from several species of scrub oaks. Each jay manages to harvest and bury anywhere from 6,000 to 8,000 acorns annually. By caching their acorns, scrub jays can eat them throughout the year.

Daily conversation consists of low, guttural trills and warbles. During territorial displays, females occasionally throw back their heads and belt out a distinctive "hiccup" call. The sentinel also uses distinctive warning calls to alert family members to predators in the area.

Biologists Glen E. Woolfenden and John W. Fitzpatrick, who have studied Florida scrub jays for more than 20 years, believe that jays may have adapted a unique social system



CHARLIE HEIDECKER

for surviving in the fragmented scrub environment. This structure revolves around a family group that usually averages three or four birds, but occasionally contains up to eight individuals. At the core of the group is a breeding pair who mate for life and keep a year-round territory. After fledging, their offspring stay in the natal territory as "helpers" for at least a year before attempting to disperse. This fundamental characteristic distinguishes them from scrub jays in western North America where young jays leave home as soon as they are independent.

Breeding occurs from March through June, with most nesting taking place between late March and early June. Scrub jays generally raise only one brood a year. However, if a nest fails, especially early in the season, a pair will attempt another. They construct the nest, a basket fashioned from scrub oak twigs and palmetto fibers, in dense shrubs, usually no more than four feet from the ground. From the three or four light-blue-and-brown mottled eggs laid by the female, two to three chicks typically survive to fledge. Fledgling mortality is high; in most seasons only about 35 percent of the fledglings see their first birthday. They become "helpers" as soon as they are nutritionally independent (approximately 85 days after hatching), remaining in their natal territory.

Helpers assist the breeding pair in daily activities such as feeding nestlings and fledglings, defending the territory, performing sentinel duties and mobbing predators. This assistance increases the chance that breeding adults will successfully raise offspring. However, helpers do not build nests, incubate eggs or brood young.

Another fascinating aspect of the Florida scrub jay's social system is the hierarchy. Males dominate females, breeding adults dominate helpers, and the oldest helpers dominate younger helpers. Because of limited habitat, potential breeders always outnumber available breeding vacancies that usually occur only when an established breeder dies. The eldest male, without opposition, moves into that position.

Because unoccupied scrub habitat does not exist, young scrub jays cannot establish new territories. When a family of jays disappears, however, jays from surrounding territories can incor-porate portions of this now-vacant habitat into their own territories. In many cases, the oldest nonbreeding male in a family will relocate, obtain a mate and become a breeder in the new territory.

> Because unoccupied scrub habitat does not exist, young scrub jays cannot establish new territories.

Although females almost never obtain territories in this manner, they benefit from the helper system in other ways. In addition to gaining experience at nesting and increasing their chances for survival by staying in the family group, they are able to constantly monitor the neighborhood for breeding vacancies or for bachelor scrub jays in budding territories.

Biologists consider efforts to protect and maintain oak scrub habitat critical for the long-term survival of Florida scrub jays. Fortunately, their popularity has heightened efforts to conserve scrub ecosystems throughout Florida. A proposal to fund 12,200 acres of land on the Lake Wales Ridge for the establishment of the Lake Wales National Wildlife Refuge now sits before Congress. Potential state acquisitions through Florida's Conservation and Recreation Lands program total another 10,000 acres. Archbold Biological Station in Highlands County encompasses about 5,000 acres of preserved scrub on the Lake Wales Ridge south of Lake Placid. Merritt Island National Wildlife Refuge, Ocala National Forest and Jonathan Dickinson State Park currently support scrub jay populations on oak scrub within their boundaries.

Proper maintenance of oak scrub habitat is nearly as important as acquisition, for it to be useful to scrub jays. Historically, wildfires blazed through oak scrub every 10-15 years as a result of lightning strikes in the late spring and summer. Scrub oaks burn to the ground, but resprout from extensive root systems that may be hundreds of years old. Acorn production is attuned to this cycle of fire, and masts are heaviest within the 10- to 15-year interval between fires. Therefore, oak scrub that burns too frequently (every three or four years) or too infrequently (every 20 years or more) may not produce enough acorns to sustain a healthy population of scrub jays.

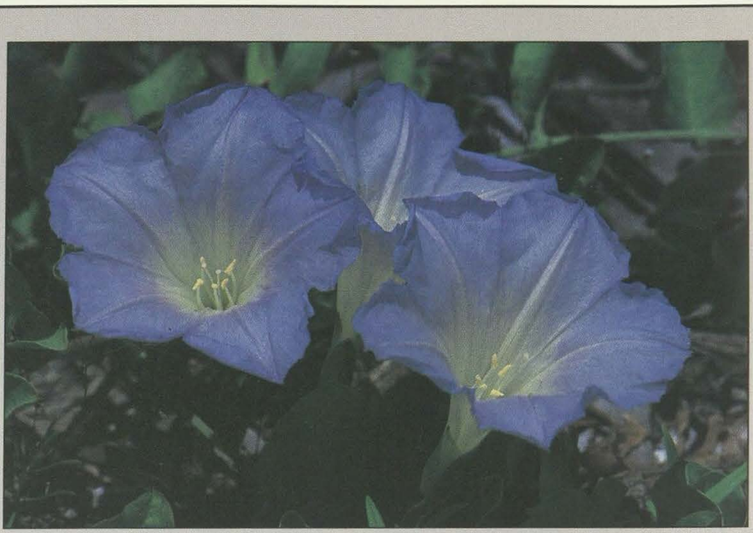
As habitat deteriorates, the jays are forced to leave and seek territories elsewhere. Scrub jays are also more prone to predation in overgrown scrub, a factor that could be equally important in influencing the jays' use of such habitats.

Florida scrub jays are friendly, curious birds that tame easily and seem to do well around people. Most human residents of scrub love the scrub jays and feed them regularly, although many have little idea of the habitat the birds require and the importance of oak scrub to the birds. As long as we can somehow hold on to the habitat that remains, these endearing jays will continue to survive as prominent members of Florida's oldest wild lands.

Jeff Ripple is a natural history writer and photographer who lives in Cross Creek.

Delicate
BALANCE

Florida Bonamia (*Bonamia grandiflora*)
Florida Status: Endangered
Federal Status: Threatened



STERLING DIMMITT

The Florida bonamia (pronounced bo-NAM-ee-uh) is one of several species of plants known to occur only in central peninsular Florida. This rare plant is a perennial vine whose delicate funnel-shaped flowers readily distinguish it as a member of the morning glory family. The bonamia seems amazingly able to withstand the rigors of the harsh scrub environment in which it lives. Its stocky root provides a mechanism for the storage of nutrients and energy needed to survive day-to-day conditions and the occasional fires that sweep through its habitat.

With a few exceptions, bonamia grow on the sands of ancient dunes piled up by wind and surf two or more million years ago when most of the Florida peninsula was under water. As the global climate grew colder, the polar ice cap froze enough seawater to expose the Florida land mass, leaving a ridge of high dunes in the center of the state. On this dry central ridge, the bonamia, along with other rare plants and animals, evolved the ability to survive desert-like conditions of soil and climate.

Arising from a central rootstock, the plant's stems trail outward for several feet reaching arm-like across the sand. Sessile, oval-shaped leaves emerge in alternating fashion along these arms. The leaves tend to stand erect along the stem, a characteristic plant adaptation for coping with bright environments.

The bonamia thrives in open, sunny places where it blooms lavishly. Generally between May and August, a showy, funnel-shaped flower emerges from the leaf base. The flowers, over 3 inches long, are bluish-purple with a white throat. This spectacular bloom gives full measure to the plant's specific name, *grandiflora*.

The bonamia sometimes grows in areas with rather dense cover, but flowering is low or even absent there. Fire is a dynamic force in maintaining bonamia habitat, and in stimulating flowering, seed production and sprouting in the plant.

Above-ground parts of the morning glory die back in the winter, and its growth cycle begins once more in the spring, if the central root is not disturbed. Disturbance, unfortunately, has been the rule for many bonamia – much of the scrub which it inhabits has been lost. Habitat destruction is the major threat to populations of bonamia existing on private land. Because this old dune scrub is high and dry, it has been a choice inland region for residential development.

Historic records indicate the bonamia once occurred from Volusia and Marion counties south to Highlands and Charlotte counties. Today, the largest concentration of the plant is found in the scrub of the Ocala National Forest, where their survival is maintained through strict conservation practices. Other concentrations are scattered through surviving scrub sites, mostly on the Lake Wales Ridge in Polk and Highland counties. The sites of bonamia that occur on land in the ridge area owned by the state and by the Nature Conservancy are protected through governmental regulation and/or careful management.

With fragments of scrub preserved and managed with wisdom, there is hope that the bonamia will be saved.

– Sterling Dimmitt

The natural history photography of Sterling Dimmitt, a biologist and a retired clinical psychologist, has been published in ***National Geographic*****,** ***Audubon*** *and* ***Natural History****, among others.*

LIZARDS

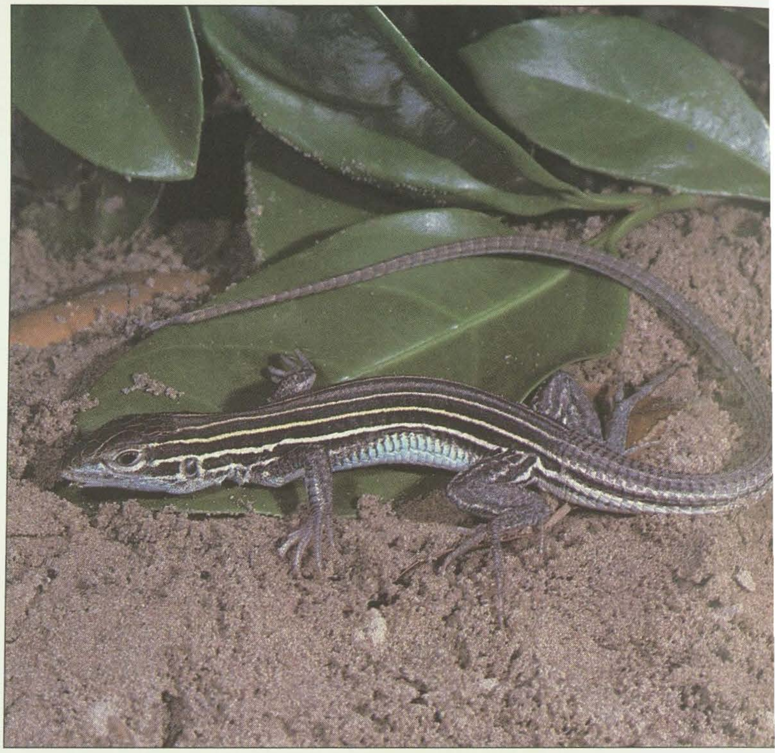
# of the Florida Scrub

By Kevin Enge
Photographs by Barry Mansell

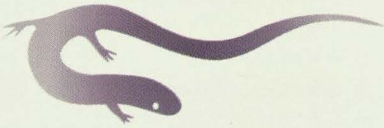
Despite its uninviting appearance, the Florida scrub harbors a wide variety of animal life, including species found nowhere else in the world. Scrub occurs only in Florida and in a few patches of coastal Alabama. As in most deserts, lizards are an important component of this community. Some lizards thrive here because they like it hot and dry, but others that like it moist and cooler can also survive here by resorting to a subterranean existence. A few inches below the surface the sand is moist and relatively cool. Some of these underground denizens utilize existing root channels and animal burrows, whereas others swim through the sand. By living underground, these animals are able to avoid the sometimes-dramatic fluctuations in air temperature and the dry surface conditions.

▷

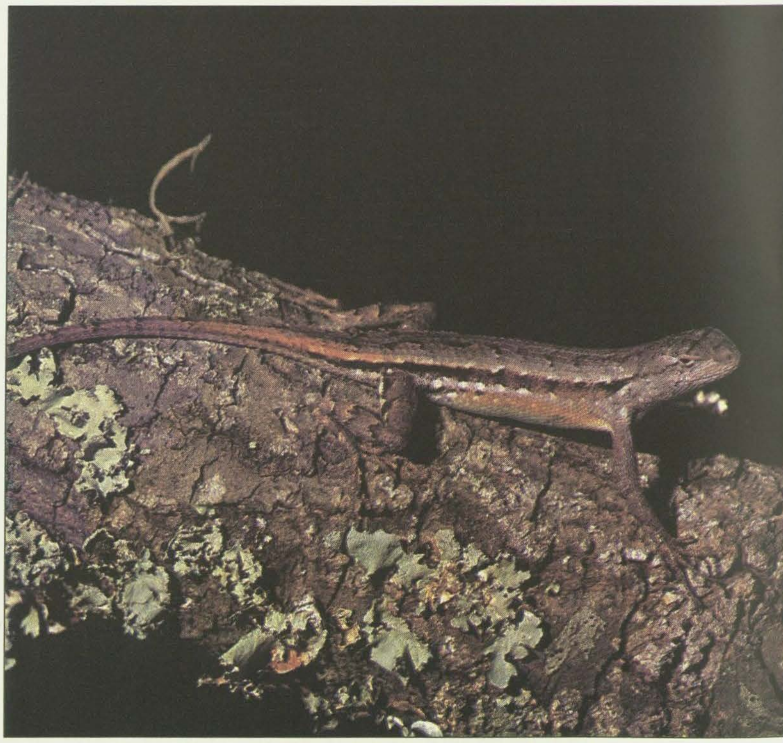
SIX-LINED RACERUNNER



One of the lizards that like it hot and dry is the six-lined racerunner, which has many relatives in the southwestern deserts. Like mad dogs and Englishmen, racerunners are out in the noonday sun. Often abundant in scrub, they are commonly observed cruising along areas of bare ground or heard rustling through leaf litter in search of insect prey. They move in an agitated fashion, darting glances from side to side and occasionally flicking their tongue out to taste the sand. Except for brief respites under a shady bush to cool down, they are in constant motion. This species can survive scorching body temperatures of 113 degrees, higher than any other lizard in the eastern United States. It is also the sprint champion, having been clocked at 17 mph. No wonder it's almost impossible to catch a racerunner by hand, except at night and during cool weather when they take shelter in small burrows dug by them or other animals. Because this species is not restricted to scrub, it can be found anywhere in the state where there are open areas of dry, bare soil, including dirt parking lots and roads.

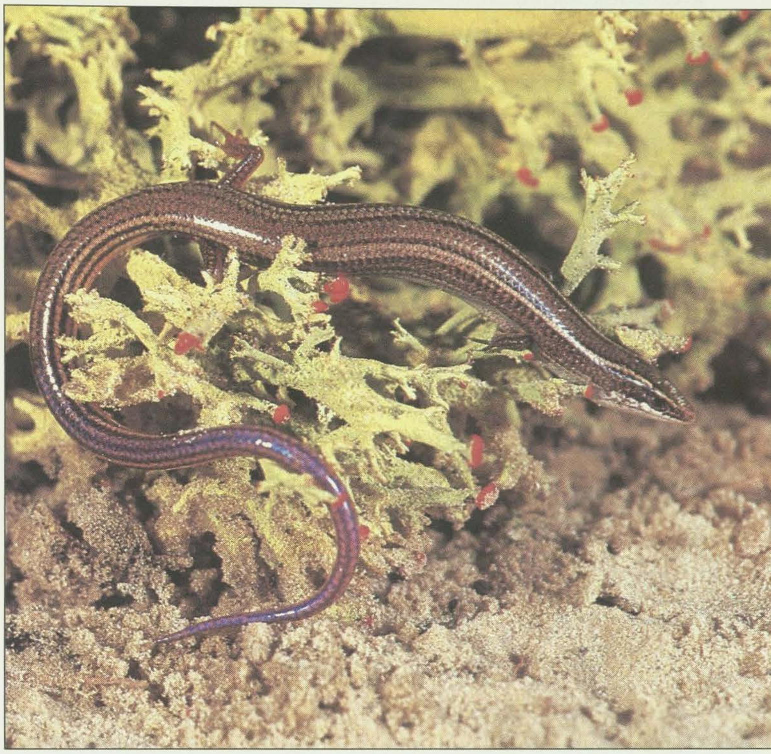


FLORIDA SCRUB LIZARD



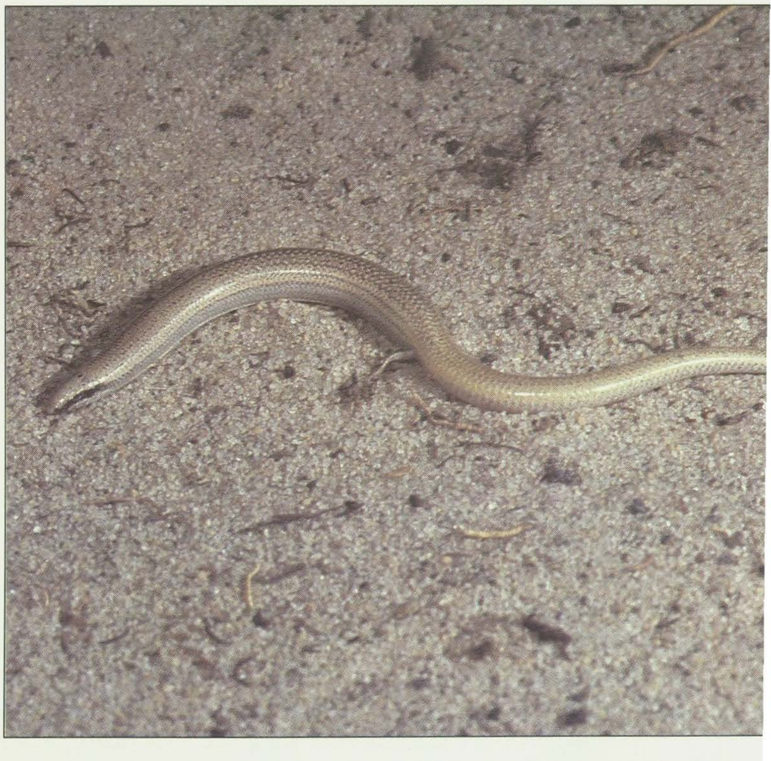
Another lizard that likes it hot and utilizes open areas of bare sand to hunt for food is the Florida scrub lizard, which occurs only in Florida and is primarily restricted to scrub, although it may inhabit disturbed sandhill sites. Superficially, it resembles the southern fence lizard, which occurs in a variety of habitats everywhere except in southern Florida. Unlike the racerunner, the Florida scrub lizard doesn't go searching for prey but instead sits and waits. It prefers to spot prey from perches near the ground, such as fallen logs, pine cones and tree trunks. Like the racerunner, it will eat anything of suitable size that it can catch, primarily ants. This species also is very abundant in some scrubs and flees swiftly when pursued. Unlike racerunners, scrub lizards may sometimes escape by climbing trees or shimmying into loose sand or leaf litter. They breed in March and April, and females usually deposit at least two clutches of 2-8 eggs from May through August. The distribution of this species is unique, confined to four different areas: the Ocala National Forest and a few scrubs to the south in Lake County, along three parallel sand ridges in central Florida, along the Atlantic Coastal Ridge from Brevard to Broward counties, and in a few scrubs along the Gulf of Mexico in Lee and Collier counties.

MOLE SKINKS



Mole skinks are small lizards that prefer living in dry habitats like scrub, sandhills, beaches and live oak hammocks. As their name suggests, they lead a mostly subterranean existence. In fall, they may be observed occasionally at the surface, but during the summer they apparently spend much of their time in underground burrows, such as pocket gopher runways. On cool, sunny days they also may be found basking 1-2 inches under the surface of loose sand, such as in pocket gopher and gopher tortoise mounds. To escape predation, they often dive into the loose sand and disappear. Although they can swim through sand, they apparently feed primarily on roaches, spiders and crickets on the surface or in pre-existing burrows. Locally common in certain areas, they often are found near fallen logs and at the bases of stumps and trees. After breeding in winter, the female lays 3-7 eggs in an underground nest cavity and stays with the eggs until they hatch 31-51 days later. The peninsula mole skink (shown here) is the subspecies most often found in Florida scrubs, but in one pocket of the Lake Wales Ridge it is replaced by the rare blue-tailed mole skink (shown on page 17). This subspecies is considered threatened by both the state and federal governments.

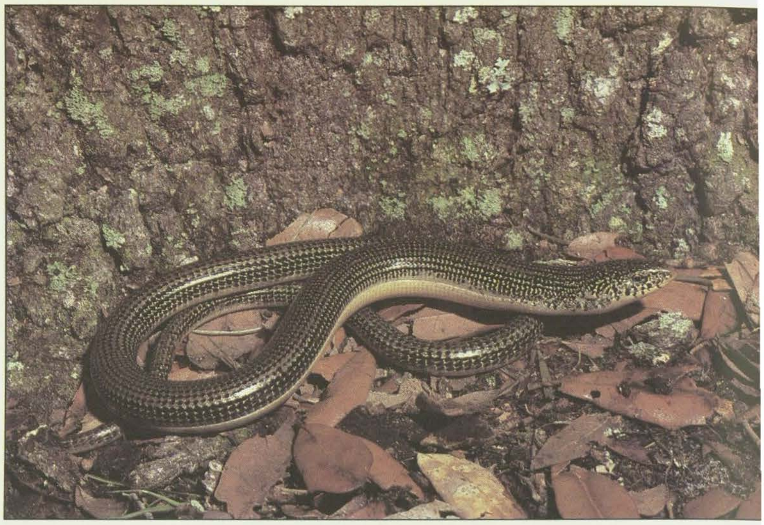
SAND SKINK



One of the most bizarre lizards is the sand skink, which is found only in Florida. In fact, it is the only member of its genus in the world. This state and federally threatened species is primarily confined to the Lake Wales Ridge in Lake, Polk and Highlands counties, but it also can be found on some adjacent sand ridges and in the Ocala National Forest. Although it may be found in sandhill habitats, it is most common in rosemary scrub. The sand skink is a pale tan color and has a wedge-shaped snout, counter-sunk jaw, cylindrical body and tiny legs that are adaptations for "sand-swimming." Since the wimpy legs are useless for crawling, this 3 to 5-inch-long lizard literally swims through the sand with undulations of its body. It feeds primarily on beetle larvae, spiders, termites and antlions that are encountered while sand-swimming. Typically, sand skinks are found in sand 2-4 inches beneath the surface of the ground, especially under detritus, although during droughts or very cold weather they may go deeper. Apparently, they may prowl on the surface during the twilight hours. They are most active during the April-May breeding season. Two eggs are usually laid underground in June and protected by the female. ▷

GLASS LIZARDS

There are also lizards completely without legs in scrub, where three species of legless, or glass, lizards are known to occur. Although the eastern (shown here), slender and island glass lizards are encountered in scrub, they usually are not abundant. Glass lizards can be readily distinguished from snakes by the presence of eyelids and ear openings. They are called glass lizards because their tails, which are about 2/3 of their length, readily break off. They spend much of their time burrowing through loose, dry sand or under debris in search of insects, spiders and small reptiles to eat.



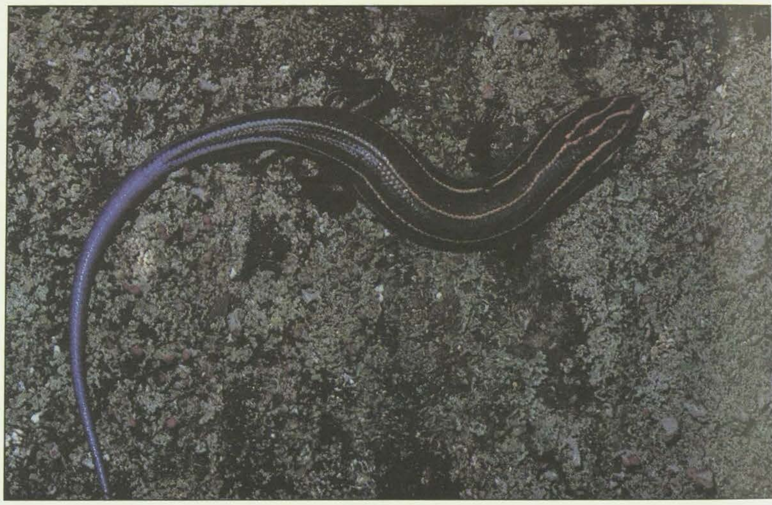
OTHER LIZARDS

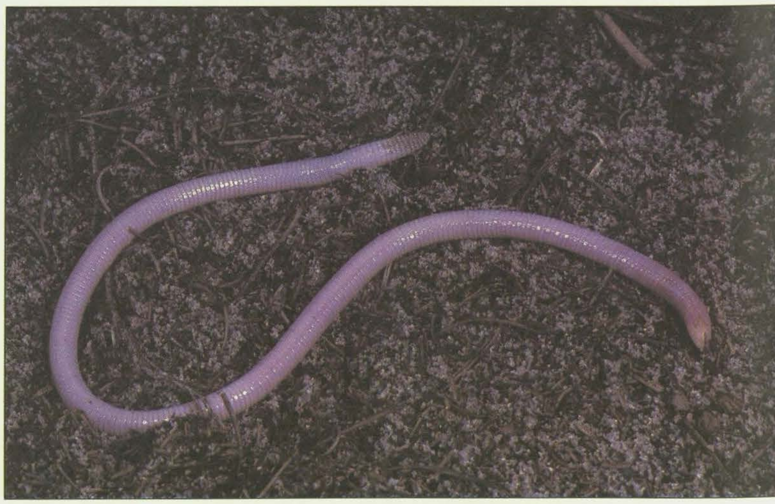
Some lizards occur in a wide variety of wooded situations, including scrub. One of these species is the green anole ("chameleon"), which spends most of its time in clumps of scrub oaks. Another species is the southeastern five-lined skink (center right), which prefers moister and cooler conditions than typically exist in scrub. This skink is most common in the shady conditions associated with mature sand pine scrub, where it usually hangs out in the vicinity of fallen logs or piles of debris. They spend the hottest parts of the day hiding under cover. The tiny ground skink also prefers moist conditions, but because of its small size can find shelter in the litter layer of oak leaves or pine needles.

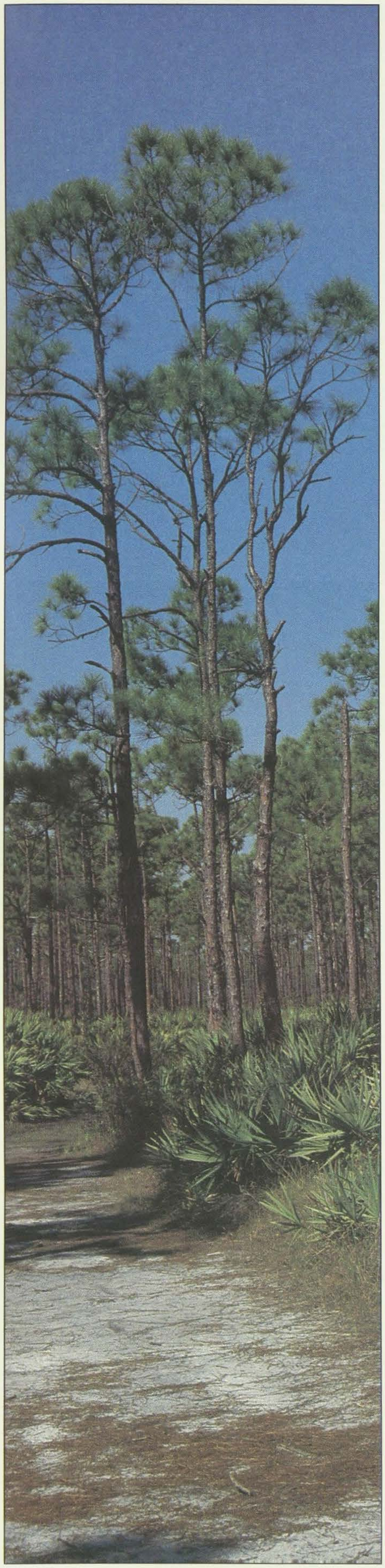
The worm lizard (bottom right), which occurs in a wide variety of habitats, is not really a lizard but a member of a group of tropical burrowing reptiles called amphisbaenids. It looks like a large, pink or flesh-colored earthworm. It is segmented like a worm, and the eyeless and earless head is hard to distinguish from the blunt tail tip. Like a worm, it spends most of its time burrowing through the ground, although it may be active on the surface in fall. Gardeners sometimes accidentally chop worm lizards in half while digging, never suspecting that the 10-inch long "worm" is actually a reptile. Worm lizards often occur in scrub and other dry habitats because, although they prefer moist conditions, they will drown in soils that become saturated.

Lizards in the scrub provide an important food source for other animals. Kestrels, Florida scrub jays and shrikes commonly prey upon them. Raccoons, armadillos and spotted skunks also eat any lizards they find. Snakes that commonly feed upon lizards in the scrub include the pygmy rattlesnake, coral snake, scarlet kingsnake, black racer and coachwhip. In addition, Florida scrub lizards, glass lizards and large skinks will eat smaller lizards.

Kevin Enge is a Commission nongame biologist stationed at the Little River Ranch near Quincy.







Florida's Scrub – How To Get There

Searching For the Old Ones

Text and Photographs by Susan Cerulean

In many cultures, the oldest members are the storytellers, the keepers of a people's wisdom. They understand the shaping of their culture, and offer visions for the future. They are honored, and sometimes feared.

The scrub is the most ancient of Florida's natural communities. It holds many biological treasures distinctly Floridian, but so little known. Half of its plants and animals are unique, found nowhere else on the globe.

Scrub is subtle, gnarled, sometimes impenetrable. Scrub is glare and prickle. Its plants are clothed in the khaki of camouflage; its animals are dry-skinned and fossorial. Its shaman is the sky-blue scrub jay, and there is no green more hopeful than the scrub oak in springtime.

Visit the scrub on its own terms. Come early in the morning, or at the end of the day. Linger. Absorb the pungence of rosemary and the brittle crunch of lichens. Inhale the flowering mint and the morning glory. Study tracks on the time-worn sands. Marvel at the jay and the tortoise, but never tame them with your food.

In our world, neither the old ones, nor the natural places, are as esteemed and protected as they once were, and most of us are too impatient to sit with what we do not understand. But for interested explorers, a variety of scrubs have been protected and opened to the public. They offer interpretive trails, visitor centers and guided walks that can be a beginning.

Listed below are seven sites where you can experience a range of types of scrub plant communities on easily-accessible public lands.

EAST CENTRAL FLORIDA

Jonathan Dickinson State Park

This 11,500-acre park harbors the last remnant of a sand pine scrub community that once extended south to Miami, and ecologists consider it the best protected example of this community. A short trail near the park's entrance passes through the scrub, then

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lifts you up to an observation platform on Hobe Mountain, the highest point in south Florida. A lovely view of the ocean reminds you that you stand on the ancient dunes of the Pleistocene sea. Along the park's main roads and bike trail, gopher tortoises and their burrows abound.

Directions: Entrance to the park is off of U.S. Highway 1, approximately seven miles north of Jupiter. For further information, contact the Department of Environmental Protection at (407) 546-2771.

Hobe Sound National Wildlife Refuge

Just north of Jonathan Dickinson State Park on U.S. Highway 1, stop at the Hobe Sound National Wildlife Refuge Nature Center. Here you may walk on a quarter-mile nature trail through a remnant sand pine scrub forest, perhaps encountering a scrub jay, gopher tortoise or numerous songbirds. Seasonal interpretive programs are offered by the Hobe Sound Nature Center, a cooperating association of the refuge. Call (407) 546-2067 for details and reservations.

Directions: Refuge office, interpretive museum and restroom facilities are located on U.S. 1, one mile south of Hobe Sound. For further information, contact the U.S. Fish and Wildlife Service at (407) 546-6141.

Merritt Island National Wildlife Refuge

Although the southernmost coastal sand pine scrubs are almost gone, in this refuge a relatively large oak scrub provides many acres of scrub jay habitat. Look for the jays on conspicuous perches on state Route 3. A visitor center with interpretive displays, maps and other information is open Monday through Friday, 8:00 a.m.-4:30 p.m.; and Saturdays, 9:00 a.m.-5:00 p.m. The center is closed Sundays.

Directions: From Titusville, travel east on state Route 402. For further information, contact the U.S. Fish and Wildlife Service at (407) 861-0667.

CENTRAL FLORIDA

Ocala National Forest

In this huge forest, the deep, sandy soils of the central ridge support the world's most extensive scrub community. Much of this scrub is managed for pulp in odd-looking blocks using clearcut logging, but in young stands of oak scrub, scrub jays are commonly observed. Look along Forest Road 88 north from state Route 40 in sand pine stands less than 10 feet high. A second plant community, the longleaf pine/turkey oak sandhills, is inhabited by red-cockaded, downy, red-bellied, red-headed and pileated woodpeckers, as well as American kestrels, northern bobwhite and wild turkey. Stop at one of the visitor centers to peruse a complete collection of maps, bird lists and general information about touring the forest.

Directions: The forest sprawls between Ocala and Daytona Beach on state Route 40, and is bisected north-south by state Route 19. For further information, contact the USDA Forest Service at (904) 625-2520.

NORTHWEST FLORIDA

The Cedar Keys

The Cedar Keys are a group of islands set in the Gulf of Mexico, about 15 miles south of the mouth of the Suwannee River. The approach to the picturesque fishing village of Cedar Key passes through thousands of acres of peninsular coastal sand pine scrub and other plant communities protected by the little-known Cedar Key Scrub State Reserve. Begin exploring the area by car east of town on state Route 24. Turn north onto state Route 347 and go about three miles to state Route 326. Turn left and, after a mile or so, begin to check the scrub vegetation and power lines alongside the road for scrub jays. Gopher tortoises also prefer these dry, sandy soils; their burrows are commonly seen.

Directions: From Chiefland, go south on U.S. 98 to Otter Creek. Turn right onto state Route 24 and follow signs to the town of Cedar Key. For further information, contact the Department of Environmental Protection at (904) 543-5567.

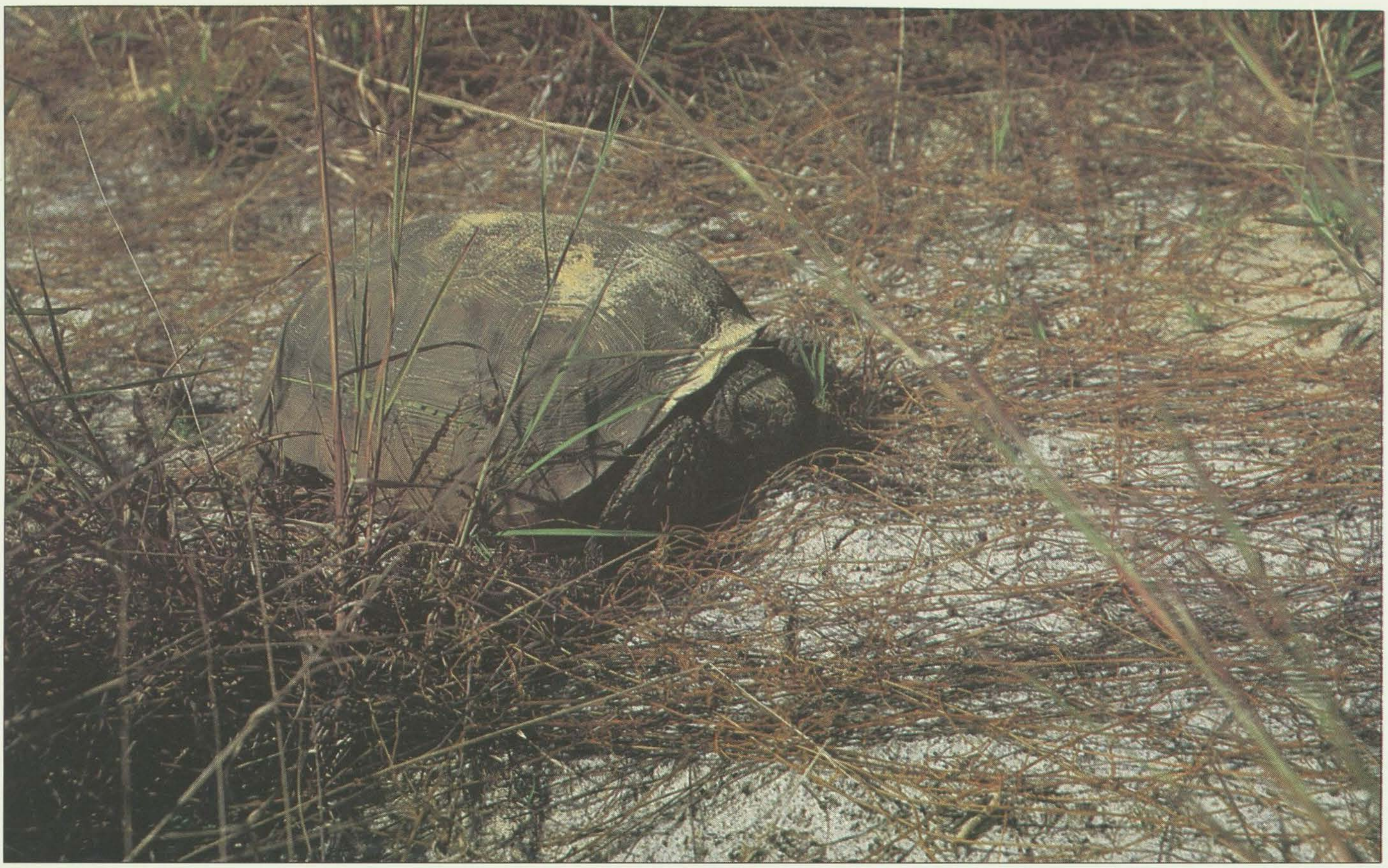
St. George Island State Park
St. Joseph Peninsula State Park

In the Panhandle, scrubs are restricted to a narrow strip along the Gulf Coast and on barrier islands. These state parks are two good places to experience the northern version of this plant community. Located on barrier islands, both parks offer miles of scrub, unspoiled beaches and dry forests to explore. On the parks' dunes, you'll encounter the same species as you saw in the inland scrubs: Florida rosemary, sand live oak, Chapman's oak, saw palmetto and sand pine.

Directions: St. George: From U.S. Highway 98 at Eastpoint, travel south across the bridge and causeway. On the island, turn left; follow road to park entrance. For further information, call (904) 927-2111.

St. Joseph Peninsula State Park: From U.S. Highway 98, turn west on county Road 30-E. For further information, call (904) 227-1327.

Biologist Susan Cerulean is co-author of the ***Florida Wildlife Viewing Guide****, just out from Falcon Press.*

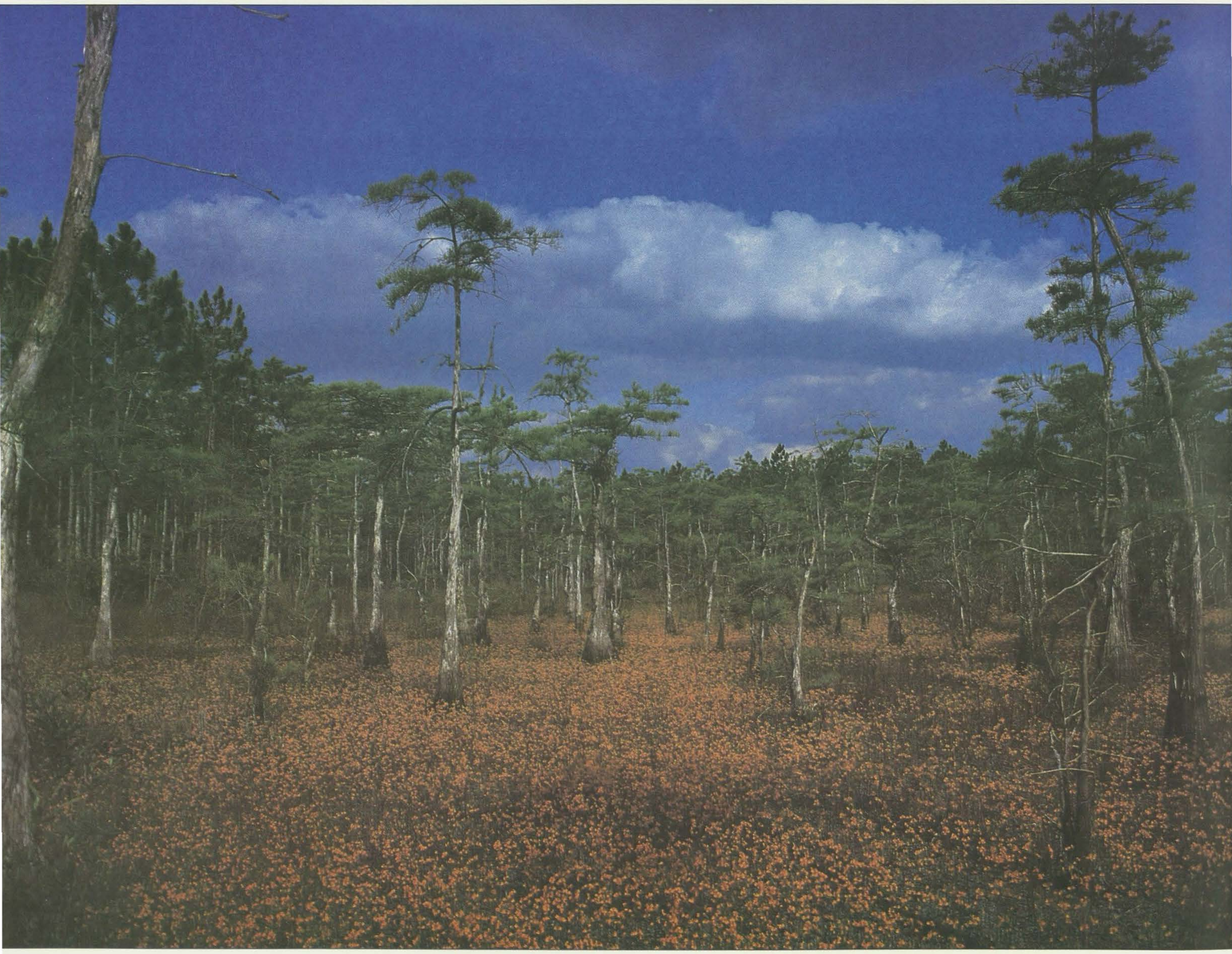


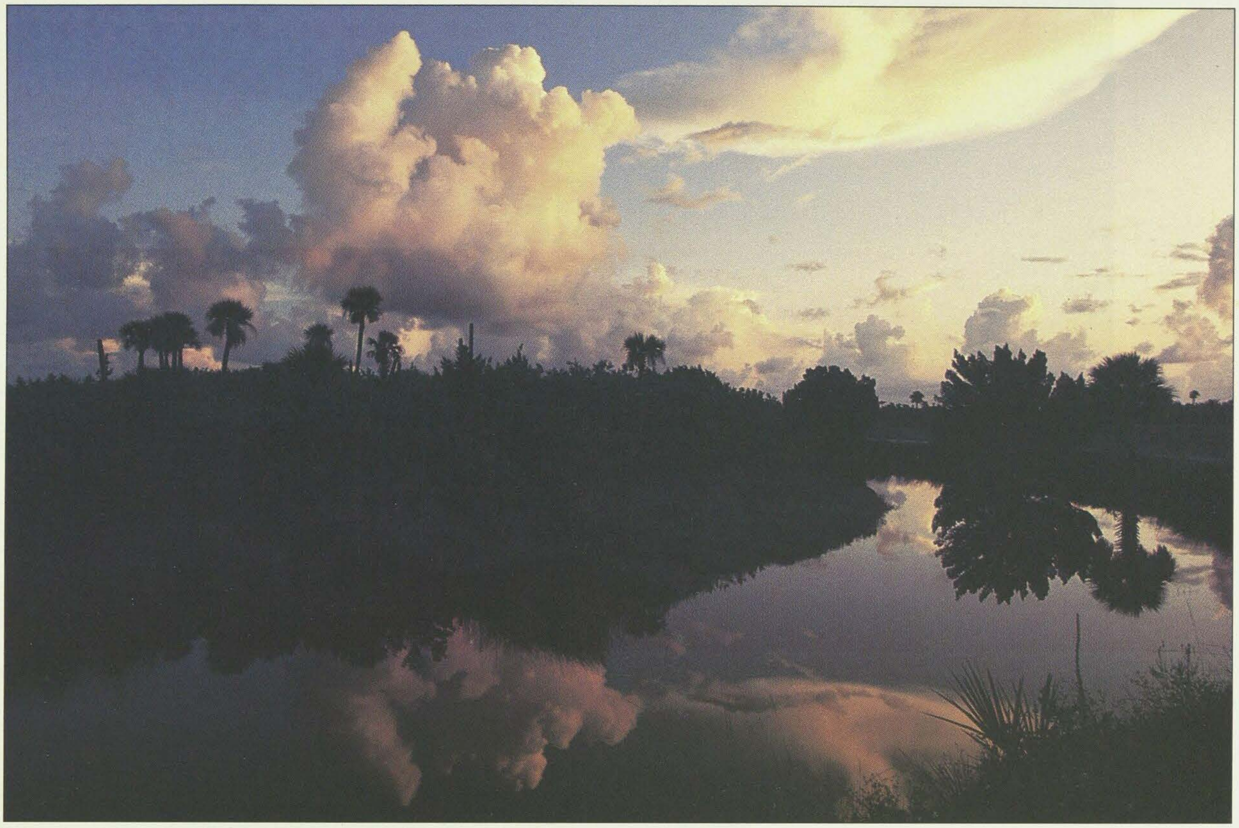
Gopher tortoises burrow in the ancient sand dunes of Jonathan Dickinson State Park (at right and on page 21), a remnant of Florida's sand pine scrub.

Florida Wildlife Photo Contest

Florida's Environment

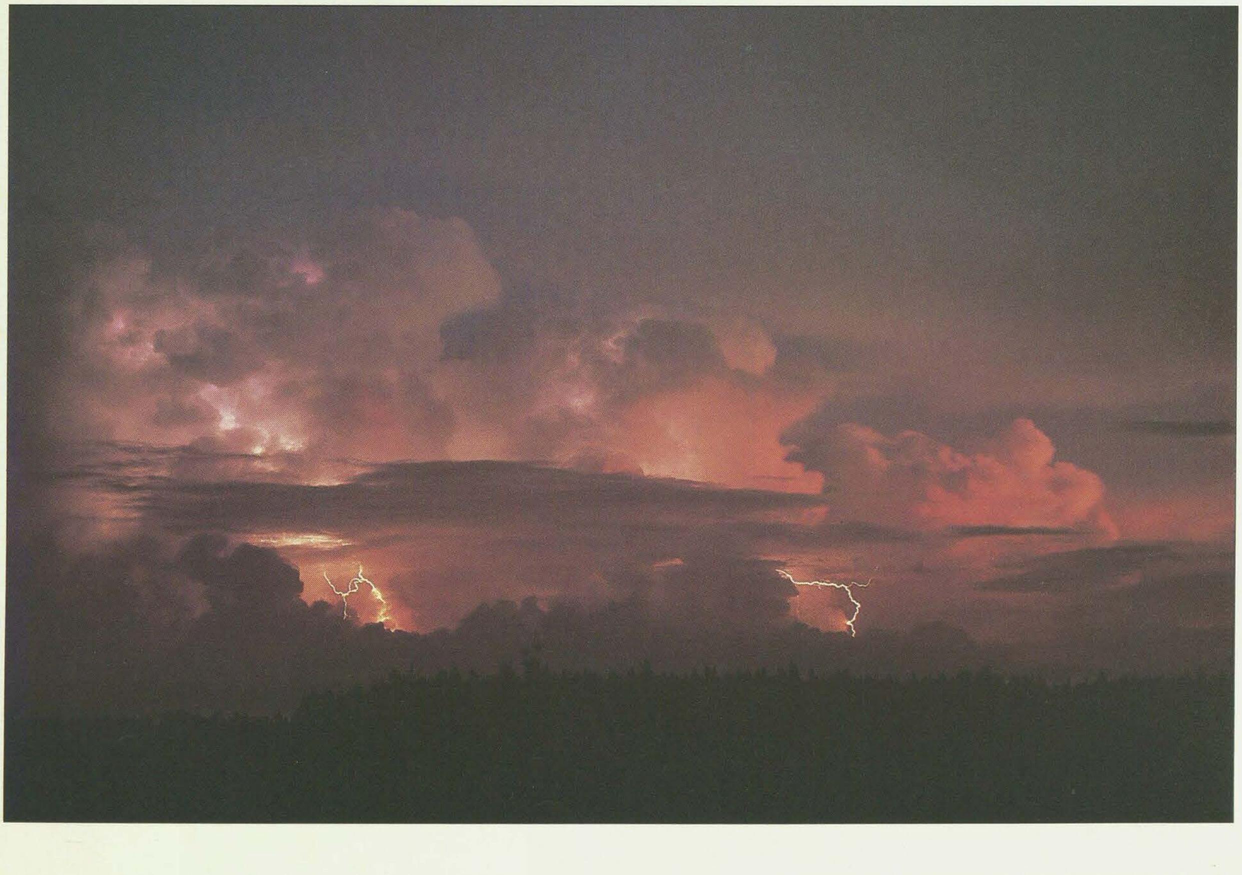
***FIRST PLACE**: BEAR ISLAND by Tony Pernas*





***SECOND PLACE**: CLOUDS by Barbara Hazard*

***THIRD PLACE**: THUNDERSTORM by Michael Warren*



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***HONORABLE MENTION**:*
PRESERVE FIRE
by Tony Pernas

***HONORABLE MENTION**:*
WETLANDS
by Peter L. Knapp

***HONORABLE MENTION**: MILKWEED*
by B. B. Boothe, Jr.

***HONORABLE MENTION**: TERRA CEIA BAY by Robert W. Topp*

▷

HONORABLE MENTION:
MARSH by Raymond K. Loraine

HONORABLE MENTION:
EMERSON POINT by Robert W. Topp

The Florida Duck or The Mallard?

We Can't Have Both

By Joyce C. Mazourek
and Paul N. Gray

Many animals native to Florida are threatened by the introduction of non-native species into the state, and the mottled duck, sometimes commonly known as the Florida duck or the Florida mallard, is one of these. Introduction of breeding populations of a closely related species, the mallard, threatens the existence of Florida's only endemic duck.

Both Florida's mottled duck and the mallard are part of a worldwide group of about 20 species of ducks that are so closely related that they collectively are called the "mallard complex." However, when mottled ducks and mallards come in contact during the breeding season they create hybrid offspring that are different from either parent.

Florida's mottled duck, one of the few non-migratory ducks in North America, lives only in peninsular Florida. The wild mallard, on the other hand, is a migratory bird that inhabits temperate zones of North America, Europe and Asia; it occupies Florida during the winter, returning north in the spring to breed.

The mottled duck is easily distinguished from the mallard – rather than the male being brightly colored and the female dull, both male and female mottled ducks are simply a mottled brown. Also, the speculum (a colored patch on the wing) is iridescent blue with bold white borders in mallards, but iridescent green and purple with, at most, a faint white border in mottled ducks. Adult male mottled ducks have a yellowish bill that distinguishes them from the females, whose orangeish bill has black blotches across the top and sides.

Introduction of populations of domesticated mallards threatens Florida's only endemic duck.

Historically, three members of the mallard complex naturally inhabited Florida: Florida's mottled duck, the black duck and the mallard. Only the mottled duck bred here. Wild populations of the other two species returned north to breed, as noted by several 19th-century naturalists, like E.D. Scott, who wrote in 1888 that mallards were not abundant in the state and were winter visitors only.

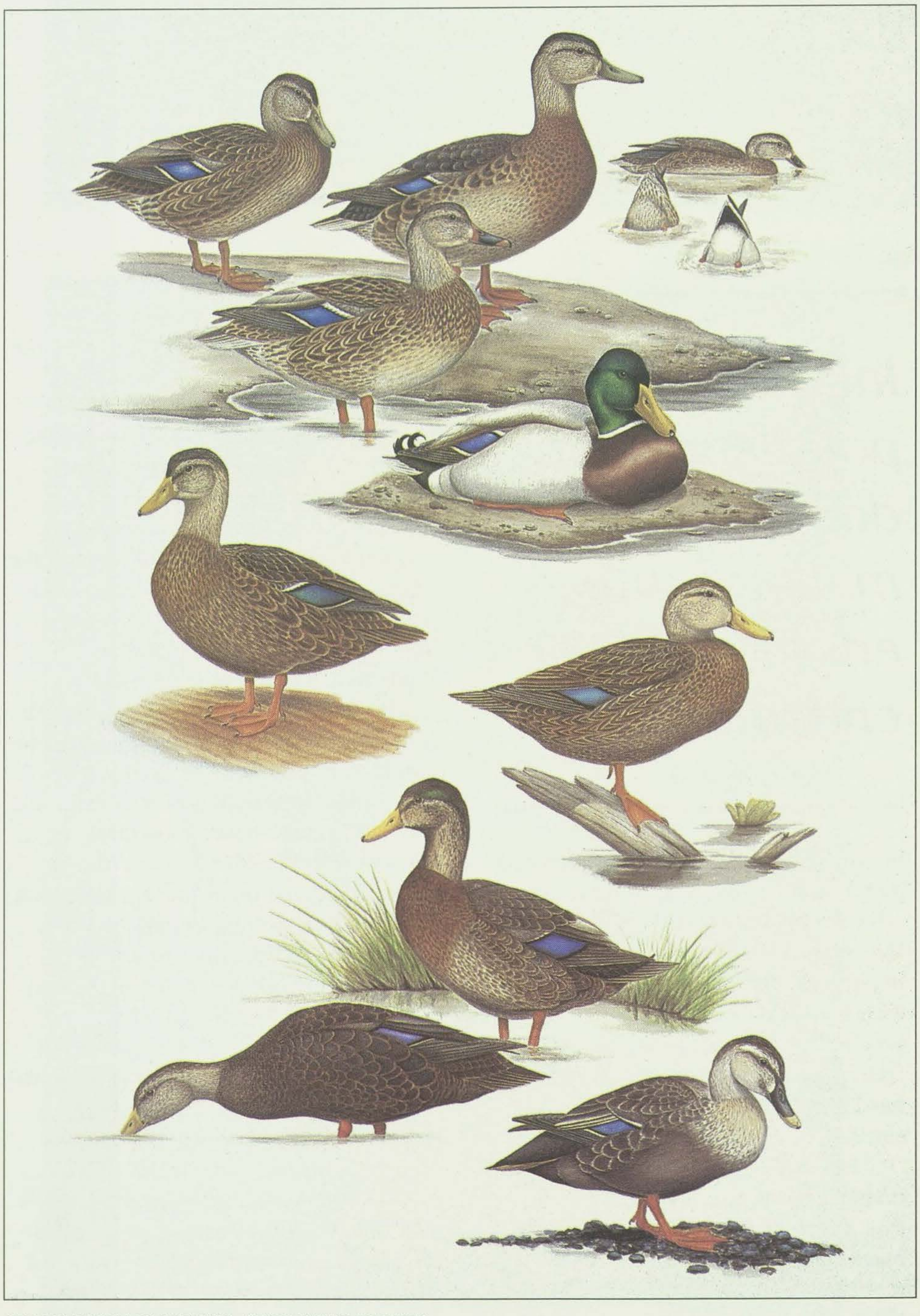
A problem now has arisen for the mottled duck, and its cause can be traced to domesticated ducks.

Only two ducks in the world are truly domesticated: the mallard and the muscovy. Both have been selectively bred by humans, just like cats, dogs and livestock, to form distinct "breeds." As with other domestic animals, all domestic mallards are the same species even though their appearances vary greatly. They range from 2-10 pounds in weight and may resemble the wild, green-headed mallards, or may be black, white, brown, blue or some combination of these. Most ducks found on canals and in parks are a breed of mallard, muscovy, or a mixture of both (yes, mallards hybridize with muscovy ducks too).

Since the early 1900s, private citizens have been purchasing domesticated mallards as pets or for hunting, and releasing them into local lakes, canals and parks throughout Florida. The problem with released mallards is that they become feral (domesticated and loose, living free in the wild) and establish breeding populations that, unlike wild mallards, do not migrate ▷

...breeding mallards are considered exotics in Florida...

Shown from the top: *male in drab plumage, juvenile, female and male mallards; "Mexican" – mallard intergrade (center right); mottled duck (center left); American black – mallard hybrid; American black duck (bottom right) and spot-billed duck (bottom left.) Mallard – mottled hybrids carry characteristics of both species.*



ART COURTESY OF NATIONAL GEOGRAPHIC SOCIETY

north in the spring. For this reason, breeding mallards are considered exotics in Florida, while migrant mallards are deemed a normal part of Florida's bird life.

The domesticated breeders often leave urban and suburban areas and begin nesting in the surrounding natural habitats where mottled ducks prefer to nest. Sometimes, too, mottled ducks venture in from "wild" areas to nest near developed areas.

As a result, the mottled ducks and mallards interbreed. Florida's mottled duck and the mallard are so genetically similar that they produce fertile offspring. Scientists are already detecting mallard genes in the mottled duck population and are concerned that interbreeding with mallards may lead to the demise of Florida's mottled duck as a distinct entity.

This concern is well-founded. The American black duck typifies the interbreeding problem. In this instance, black ducks hybridize with wild mallards, which have expanded their range into black duck territory (northeastern United States and eastern Canada), primarily because of habitat alteration.

Their courtship displays are so similar that, oddly enough, male mallards may even be better than black ducks at attracting females. When mallard and black duck males compete to mate with the same female of either species, the mallard is more likely to successfully pair with the female. His attractive color and dominant behavior presumably give him an advantage over the dull-colored male black duck, resulting in hybrid offspring that usually look more like mallards than black ducks. About 5 percent (and as many as 30 percent in some areas) of the black ducks in eastern North America exhibit obvious mallard traits, and hybridization appears to be increasing.

The problem of mallard hybridization is widespread and serious. In New Zealand, introduced mallards are hybridizing with another member of the mallard complex, the grey duck. During the past 80 years, mallards have been released there to supplement wild duck populations for hunting, and now the proportion of pure grey ducks remaining is only about 5 percent of the grey duck/mallard population. In a very short time, New Zealand's grey duck is expected to disappear from the wild. In Hawaii, the Hawaiian Duck National Wildlife Refuge no longer has pure Hawaiian ducks; the birds are mostly mallard. Virtually the entire population of the Mexican duck in the United States has been hybridized with mallards and may not persist, and in Madagascar, it appears that the Meller's duck faces a similar future. All the above examples can be traced directly to human activities, especially the release of domesticated mallards. Fate will deal the same bad hand to the Florida duck if current trends continue.

What can be done to help? Breeding mallards must be recognized as exotics in the state, and the release of additional mallards stopped. Release or relocation of ducks without a permit is a violation of Florida Statutes. (See "It's The Law," page 41.) Unfortunately, most people are unaware of these rules and often do not understand why such a rule would exist. In addition to the hybridization risk, released mallards (and muscovies) often transmit diseases such as avian cholera and duck viral enteritis to wild waterfowl.

The American Association of Wildlife Veterinarians recognizes the hazards of introducing exotic species and has issued a resolution encouraging government agencies to limit populations of domestic waterfowl in the United States. In the dispassionate world of biological science, the control and eradication of exotics is sound conservation practice. However, eliminating feral mallards from Florida would distress many people who enjoy having them around their homes and in parks.

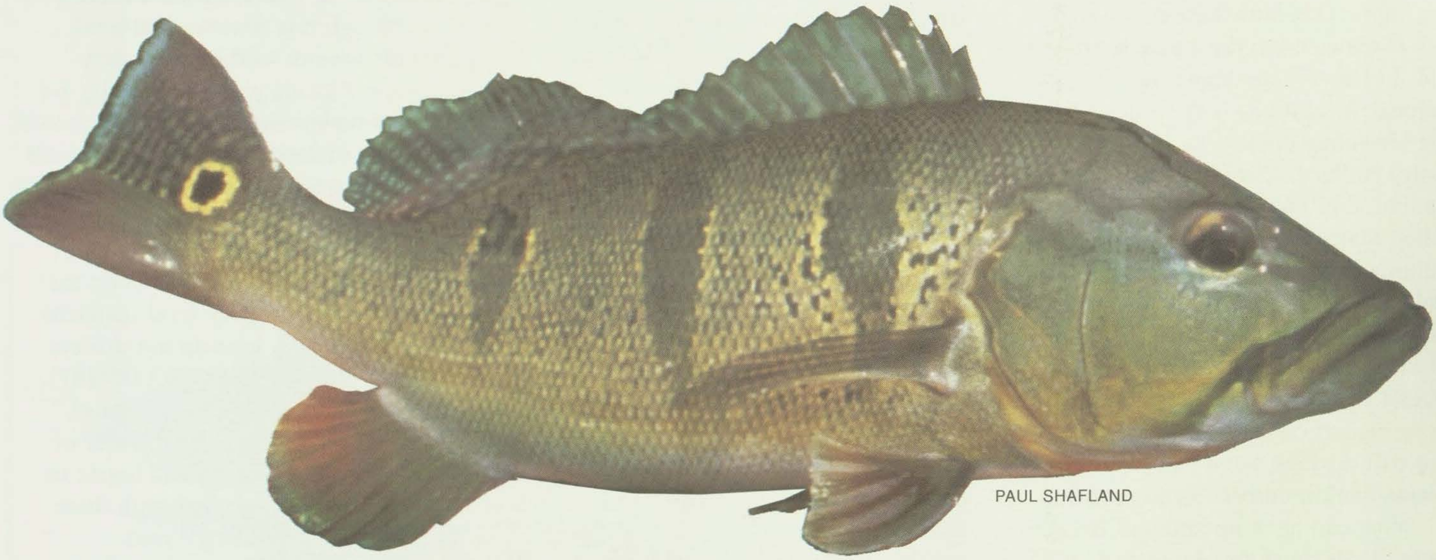
Florida's mottled duck. LYNN STONE

The U.S. Fish and Wildlife Service has written regulations that protect our nation's waterfowl, but ironically, these regulations can be interpreted as protection for these Florida intruders. Even though it is obvious that feral mallards are not wild because they remain in Florida year-round, they are included under the same federal definition of "migratory birds," as wild ducks. Therefore, feral mallards, their nests and their eggs are protected under the Migratory Bird Treaty Act. This creates considerable confusion on the legalities of controlling feral mallards because Florida's laws do not protect domestic ducks (F.A.C. 39-1.004(87). The Florida Game and Fresh Water Fish Commission is in the process of addressing this situation and hopes to develop guidelines to deal with these difficult and conflicting issues.

Citizens can help now! Mallards should never be released or fed, especially those present in Florida during the summer. We also should encourage our neighbors not to release or feed mallards. Much of the battle for saving the mottled duck must be waged by spreading the word to people who do not know why releasing and supporting feral ducks is harmful. To some people, having Florida's mottled duck hybridized out of existence may not be a concern. To people with more of an appreciation of the natural world, losing the mottled duck is akin to destroying an original work of art – it cannot be replaced. Ever.

Today, the future of Florida's mottled duck is uncertain. Scientists can predict what will happen, but society must decide what does happen. It is up to us. Our generation is deciding if these ducks are to remain a part of our planet's natural heritage. Hybridization is happening now.

Joyce Mazourek, who worked as a temporary technician for the Commission's Waterfowl Management Section, now pursues a master's degree at the University of Missouri. Paul Gray, Ph.D., is a biological scientist with the Waterfowl Management Section in Okeechobee.


PAUL SHAFLAND

Butterfly Peacock Bass
Fishing For The Record

By Bob Huttemeyer

Introduction of South America's sporty butterfly peacock bass to the Dade and Broward County canal systems in the mid-1980s is an ichthyological success story. The bass was the first ever exotic fish expected to establish permanent residence that was legally introduced into open Florida waters. This was an attempt to utilize exploding populations of spotted tilapia, which were fast becoming a menace to the native fish in the canals, to develop a popular sport fishery. It worked!

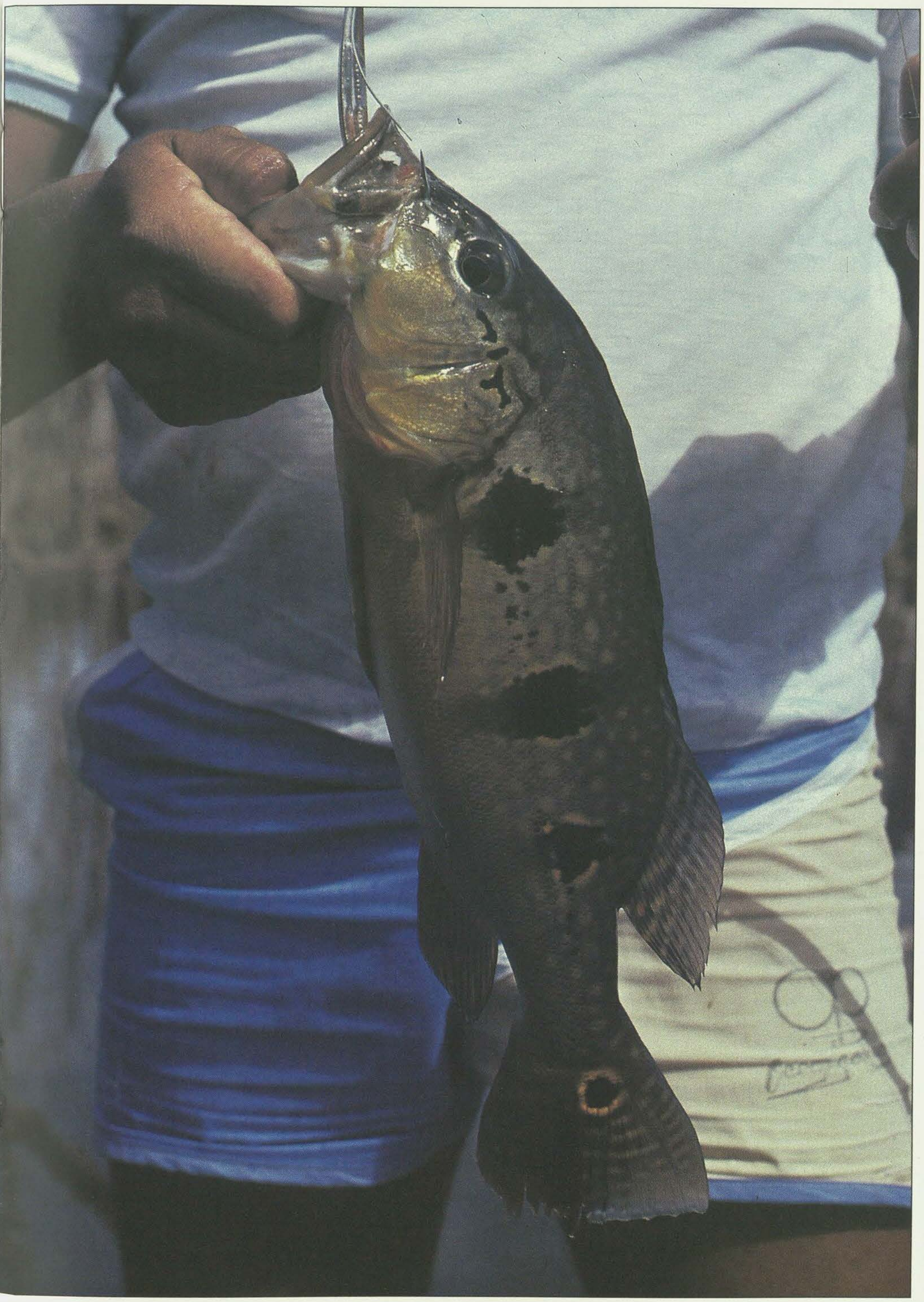
The 20,000 butterfly peacock bass fingerlings stocked between 1984 and 1987 have more than met the Commission's expectations. The fish have grown well and reproduced to the point that no further stocking of the species is needed. Their distribution is restricted to extreme south Florida because of intolerances for temperatures lower than 60 degrees.In addition to a number of economic and biological dividends, those early plantings are now yielding fish of record proportions.

Biologists expect the eventual record butterfly peacock bass to top out at about 10 pounds, but until that happens, the record keeps being broken. The current state record is Jerry Gomez's 9-pound, 1.25-ounce fish, caught on a Rapala plug in Kendall Lakes on March 11, 1993.

Competition to land a record butterfly peacock bass is keen, but before you can register a record fish you first have to catch it. South Florida anglers have had several years to learn the ways of the wily pavon, as it is called in Spanish, and how to cater to its appetite. Here are some important tips on catching peacocks garnered from expert fishermen who concentrate on this fishery.

The original 20,000 butterfly peacock bass from South America that were stocked by the Commission took to the Dade and Broward County canals like raccoons to a moonlit cornfield. The best-known places in which to catch butterfly peacock bass are Snapper Creek (C-2), Snake Creek (on the Dade/Broward border), Belair Canal (C-100 series), the Pompano

BOB MCNALLY



Biologists expect the eventual record peacock bass to top out at approximately 10 pounds.

Canal (C-14), Black Creek Canal (C-1) System, and the Miami Airport lakes, which are part of the Tamiami Canal System (C-4). Schools of young butterfly peacock bass are plentiful throughout the C-100 Canal, and small peacock bass are now commonplace. Quite a few condominium and golf course ponds that have connections to the large canal systems now contain peacock bass. The pavon slip through the opened floodgates of these small lakes and ponds and establish new territories.

When you target butterfly peacock bass, the key word, as far as lures are concerned, is SMALL. Forget what you learned about using jumbo wild shiners or large spinnerbaits or plugs for largemouth bass! Peacocks, as a rule, won't hit large baits. They also have a preference for underwater lures (crankbaits), and usually shun plastic worms. Paul Shafland, director of the Commission's Non-Native Fish Research Laboratory in Boca Raton and the father of the peacock bass introduction, said (in jest), "If you cast a small rock long enough, one would probably go for it. They will hit anything, sometimes."

Alan Zaremba and Gregg Norling, professional guides who specialize in peacock bass fishing, favor small underwater lures. Zaremba likes small Shad Raps, bucktails, Beetle Spins, white-colored grubs and small spinners. Norling prefers a floating Rapala (black back/gold belly) in sizes #5 to #9, fished under the surface with a reel-and-jerk retrieve. He also uses Gitzits, a tube lure which landed angler Jed Drucker a 6-pound, 7.2-ounce butterfly in Snapper Creek (C-2) in April 1991 that for a time held the state record.

Outdoor writer Dennis Rau and his fishing companion, guide Clark Fettes, spend every spare hour fishing for the feisty pavon. They have found 1/32-ounce crappie jigs, fitted with 2-inch, double-tail chartreuse grubs, to be ▷

excellent lures for both surface and underwater use. On a trip with these peacock bass aficionados to the C-100 Canal (located at The Falls Shopping Center, Kendall) Fettes began the day casting the jig toward brush piles and retrieving it at top speed across the surface of the water. The fish really boiled on the small lure.

The limit on the butterfly peacock bass is two fish per day, only one of which may be longer than 17 inches. For this reason, anglers are encouraged to release the fish after catching them. This is necessary to maintain a quality fishery because of the fishing pressure in the area.

Unlike the native largemouth bass, the butterfly peacock bass is not only more aggressive in pouncing on a lure that invades its nest, it will repeatedly do this after having been caught and released. In the case of bedding peacock bass, catching and re-catching the same fish can subject it to undue stress. If nests are being fished at all, Shafland says, at the very least anglers should be aware of the nesting habits of the peacock. "Return a fish quickly to the water after catching it and it will return to the nest," he said. "But don't 'hammer' them."

Most guides usually put some small, domestic shiners in their livewells for insurance. Many times peacock bass that shun an artificial lure will readily pick up a small shiner. The shiner is hooked through both lips and free-lined without a sinker. The fish will immediately drop the bait if it feels any resistance. Peacock bass take a live bait in similar fashion to a snook. They just move off with it, and you can set the hook immediately.

Most fishermen use light tackle for pavon, rarely going above 8-pound test line. Ultra-light tackle is fine, but some of the best fish are caught around brush piles or bridge abutments where stouter tackle is required. The use of snatch hooks in the canals is illegal.

I have seen anglers fishing in Miami Airport lakes with very rudimentary and improvised tackle. One used a heavy boat rod, with line more suited for catching kingfish from a driftboat. Others were using plastic 2-liter soda bottles with the line, sinker and baited hook wrapped around the bottle. The line, cast with a flick of the wrist, came off the bottle as smoothly as it would from an expensive spinning reel. Boat rod and bottle-rig users caught fish.

Butterfly peacock bass enthusiasts call their quarry "banker's hours fish" because one doesn't need to get up before dawn to catch them. As a matter of fact, butterfly peacock bass prefer the warmth of the sun to the cool of early morning. On a recent outing, a cold front blew in from the west in early afternoon, and the fish, which had been biting well, shut down completely. Though butterfly peacock bass provide good fishing year-round, the sport is best during the spring and summer months.

The canals leading from Miami Airport lakes average 10-12 feet deep in the center, with occasional holes that drop to 40 feet. Vegetation consists mainly of hydrilla, panic grass and water lilies. Unlike largemouth bass, butterfly peacocks are not likely to be caught around grass beds or vegetation. Guide Norling claims they even prefer rock or vertical concrete structure to wood, which may be attributed, he thinks, to the fish's genetic makeup since, in their native Latin America, they frequent rivers where rock and gravel are prevalent.

In the Miami Lakes canals we caught most of our fish around bridge pilings and abutments, under the bridges and at drop-offs. The fish also tended to hang around the shadow line of bridges. On several occasions the

RECORD FISH

Angler/Date	Weight	Lure/Bait	Where Caught
Jerry Gomez, 3/11/93	9lbs.-01.25oz.	Rapala	Kendall Lakes
Philip Hines, 12/19/92	8lbs.-12oz.	Live shiner	Perrine Canal
Jesse Roberts, 12/14/92	7lbs.-10.50oz.	Shiner	Hidden Lake
Roberto Duran, 4/19/92	7lbs.-06.50oz.	Dead shiner	Airport Lakes
Nelson Gardner, 2/19/90	6lbs.-15.75oz.	RatLTrap	Naranja Lakes
George Walker, 8/3/91	6lbs.-13oz.	Jewelfish	Snapper Creek
Jed Drucker, 4/7/91	6lbs.-07.25oz.	Tube lure	Snake Creek
Mark Soucy , 11/24/90	5.36lbs	Earthworm	Belair Canal

HOW TO REGISTER A RECORD

Keep the fish alive. If this is not possible, place it in ice water. Do not freeze the fish because it will dehydrate, causing it to lose weight. Have your fish weighed as soon as possible on a state-certified scale, with a Commission employee present. The angler must have a valid Florida fishing license and the fish have been taken by a legal sport fishing method.

To obtain related information on the butterfly peacock bass, including a list of guides, you may contact the Non-Native Fish Research Laboratory at (407) 391-6409.

fish would follow the lure and strike as it neared the boat. On one occasion an overly aggressive peacock bass leaped clear out of water and grabbed a Rapala I was about to lift into the boat. When we fished the C-100, which has a similar depth of water as the Miami Lakes canals, we found some of the biggest peacock bass around sunken trees and brush that had been deposited by Hurricane Andrew.

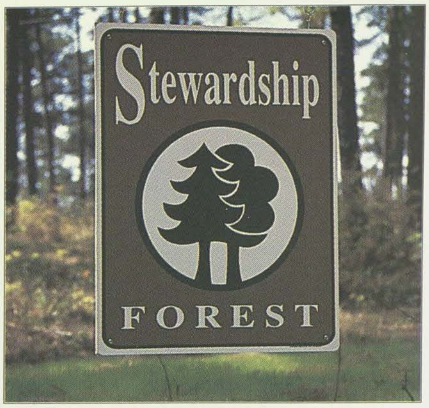
The strike of the pavon is vicious, followed by a series of strong underwater runs, very similar to the fight of a jack crevalle. Guide Zaremba told me that fish under 2 pounds usually will not jump, while the larger fish often leap several times during the struggle. Furthermore, the obliging peacock bass does not head for entangling structure the way a largemouth bass does, preferring to slug it out with its adversary in open water.

To fish Miami Airport Lakes put in at the ramp in the small park west of the lakes. To get there take Red Road off the Dolphin Expressway (836), and proceed south to N.W. 7th Avenue. Go east about one mile on N.W. 7th Avenue to the small park on the left side of the road. This is a first-class ramp, and a safer place to leave your trailer than the poorer ramp directly across from the airport runway. Snapper Creek (C-2) can be accessed from a ramp located near the junction of Snapper Creek Drive and S.W. 99th Avenue. The C-100 Canal in Kendall has a ramp located behind the Falls Shopping Center on U.S. 1. Local tackle shops can provide information on ramps or launching sites for other canals.

Many peacock bass have been transplanted to private ponds, rockpits and canals in southern Palm Beach County by well-meaning anglers who took the fish home in their boats' livewells. Florida law, however, prohibits the stocking of exotic fish except by the Commission. The introduction of exotic fish is a complicated and serious matter, the results of which depend not only on the fish but also the environment into which it is being introduced. Any movement of exotic species is contemplated only after thorough studies, and failure to do so can lead to environmental catastrophes. Moreover, the movement of exotic species is highly controlled and can result in large monetary fines, property confiscation and worse.

Bob Huttemeyer is a free-lance outdoor writer from Tequesta.

MR. & MRS. ROBERT A. HUTTEMEYER



SCOTT SANDERS

Managing The Modern Forest

By Janisse Ray

Because forest management these days requires more ecological savvy than ever before, private landowners now can enlist technical (as well as financial) assistance from the Forest Stewardship Program.

DICK SUBLETTE △

When Panama City physician Steve Toner bought a 1200-acre tract of neglected timberland in Madison County, he considered it an investment. The land, left unmanaged for years, was an unproductive tangle of saplings, vines and weeds.

"Had we pursued our original plan we would have clearcut as much as we could, and planted all of it in pines," Toner said. Today, however, this piece of land is slowly returning to a forest like the one that existed there generations ago.

Toner learned about Florida's Forest Stewardship Program, run by the Florida Department of Agriculture and Consumer Services' Division of Forestry. A number of agencies, including the Florida Game and Fresh Water Fish Commission, cooperate to bring private landowners like Toner the up-to-date technical and financial help needed for sound land management.

"A lot of people viewed the program as just another tree-planting program," said Scott Sanders, a biologist who coordinates the Commission's efforts. "But it opens so many more doors." Besides timber, the program encourages landowners to manage for wildlife, both game and nongame species, for soil conservation, for outdoor recreation and for native-grass rangeland.

Now, after a series of tree plantings conducted over a few years to create stands of different ages, about 500 acres of Toner's tract is planted in slash and longleaf pines. The rest is a mosaic of upland hardwood hammock, cypress swamp and other naturally occurring habitats.

Producing trophy white-tailed bucks is one of Toner's main objectives for the property. To achieve this, approximately 3 percent of the property is managed as early successional openings, supplementally planted in a mixture of perennial and annual forage species – a year-round food source for the deer, as well as for turkey, quail and songbirds. In addition, individuals harvesting deer on the property are required to be selective in order to promote a balanced ratio of males to females, and to allow the bucks to achieve trophy size.

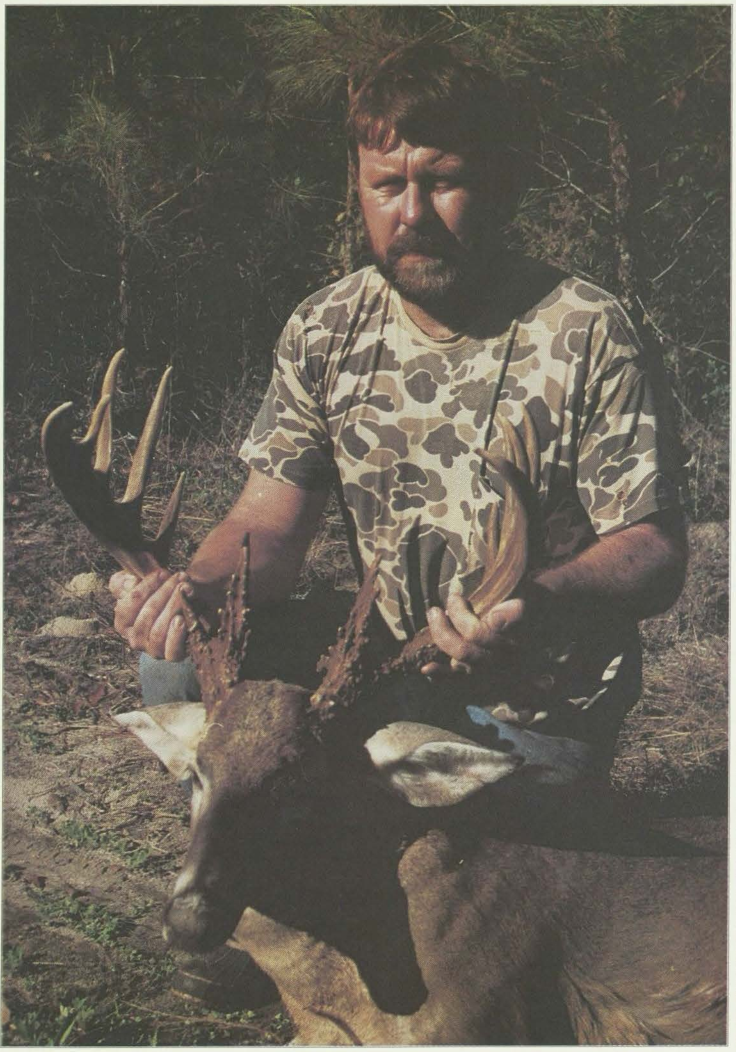
Management efforts are beginning to pay off. So far this year, four trophy bucks – one of which sported 20 points – have been taken.

Basically, the Forest Stewardship Program takes an ecosystem approach to managing a piece of land, based upon the landowner's personal objectives. Completely voluntary, it tries to balance the needs of the landowner with the good of the forest. "It's a partnership based on cooperation, not regulation," Sanders said.

The program, which began in 1990 and has grown by leaps and bounds since, offers landowners solid advice from a team of land management experts – including a biologist, a forester, a soil conservationist and an extension agent. Participants can receive financial assistance for tree-planting, developing wildlife openings and for other forest management activities. They may also receive recognition for their resource management efforts through "Stewardship Forest" certification.

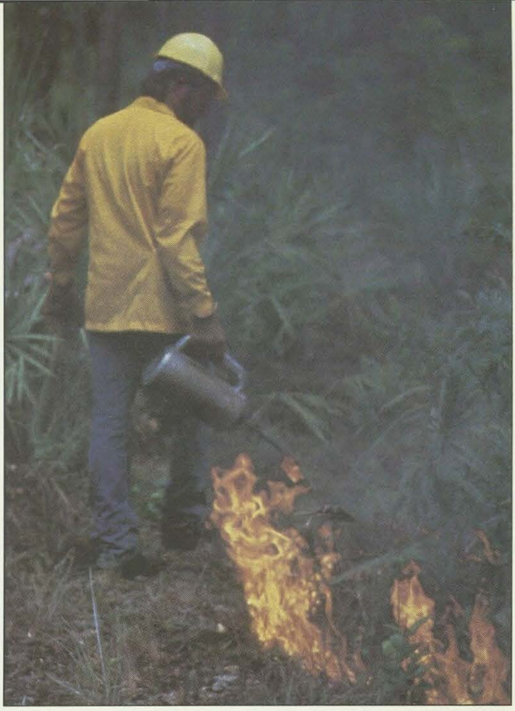
Before a landowner is taken into the program, the person must sign a non-binding "Forest Stewardship Creed" that signifies their commitment to the stewardship ethic. Resource specialists from the program visit and review the land, with the landowner, then write a Stewardship Management Plan, which Sanders believes is the most important thing the program provides.

Three types of landowners partici- ▷



FLORIDA WOODS & WATERS MAGAZINE

This 20-point buck was taken from a tract of land near Perry that is managed for trophy deer through the Forest Stewardship Program.



Many of Florida's plant and animal communities are dependent on fire. At right, landowner Terry Glancy ignites a prescribed burn.

PHOTOGRAPHS BY TERRY & BARBARA GLANCY

pate: those who have practiced little to no active management; those who have managed for one resource, but wish to diversify; and those who already practice multiple-use management, perhaps without a plan.

The latter was the case of Barbara and Terry Glancy, a couple of knowledgeable and dedicated conservationists who own 15 acres of rare pine rocklands in Dade County, one of the last patches left. Six endangered species have been found on their land; in all, 300 plant species – mostly endemic, some threatened – occur there. The Glancys also have noted a variety of wildlife on their land, including bald eagles, fox, owls, coral snakes, pygmy rattlers and red-tailed hawks.

Their forest was the third in the state to be certified as a Stewardship Forest. It is managed primarily to benefit the Dade County slash pine and the other native biota there in order to restore and maintain a productive rockridge pine ecosystem. Since this pine requires fire in order to successfully regenerate, the Glancys' primary management tool has been prescribed burns.

When Hurricane Andrew hit almost two years ago, at least three tornadoes ripped through the extraordinary property. The trees that weren't destroyed during the storm were killed by a subsequent infestation of Ips beetles, leaving the Glancy's land absolutely void of any living trees. Plans are underway to reforest their property in 1995 with seedlings grown from locally collected Dade County slash pine seed.

Since they were already actively managing their property, and were both certified prescribed burners, the Forest Stewardship Program played a different role for them than for Toner. Affiliation with the program gives them official recognition for their efforts to preserve the increasingly rare plant community comprising their property. "It's another stopgap against development," said Terry Glancy. "We want to preserve this piece of property using any method we can."

To date, approximately 500 landowners are enrolled in the private-land stewardship program. Over 300 of these, representing approximately 205,000 of Florida's 7.1 million acres of private, non-industrial forestland, have approved management plans and are pursuing goals for the land in an ecological fashion. More than 30 are certified forest stewards and display a "Stewardship Forest" sign at their property entrance.

While growing timber is the primary objective for half of the participating landowners, over half of the total acreage enrolled in the program is managed primarily for wildlife habitat. The remaining landowners list reasons of aesthetics, recreation, grazing and soil/water conservation as their modus operandus.

No land is limited to one use. In fact, the contrary is encouraged, and Paul Curry, for one, laments that "people can be too single-minded about uses for their land."

In 1990, when Curry bought an 805-acre tract in southern Putnam County, he knew what he wanted to do with the land – continue to raise cattle, and convert some of the pasture to timber. That was the easy part. He also wanted to improve wildlife habitat both for hunting and observation, and unable to find help, tackled the job himself. "I just didn't feel as though I was doing the right things," Curry said. "I knew I needed some guidance but I didn't know what was available."

Then his county forester, Ned Neenan, introduced him to the Forest Stewardship Program. Their integrated plan called for planting slash pine in a configuration that would provide cover for wildlife, planting a mixture of hardwoods and pines along pasture perimeters, erecting wood duck boxes in wetland habitats, maintaining permanent openings, and utilizing prescribed burning in the flatwoods to enhance habitat diversity. Other recommendations included rotational grazing, overseeding with vetch and clover to increase cattle and wildlife forage, erecting blinds for wildlife photography and hunting, and constructing a boardwalk to improve hiking access to a wetland hardwood hammock.

The program made a believer out of Curry. "Whether it's for quail, sandhill cranes, bluebirds or deer, I feel good knowing I'm finally doing the right things," he said. "I can have abundant wildlife and still raise livestock and grow healthy trees."

The plan the biologists and foresters construct is simply a recommendation, of course, designed to create a species-rich environment using the most ecologically sound management practices. Owning property, they realize, can be a complicated and burdensome economic task, with landowners plagued by mortgages and property taxes.

"Every live oak that you don't have injected or girdled to make room for shade-intolerant pines is a trade-off, and a reduction in production on a direct basis," explained Sanders. "These days we know people who want to hang onto property, but don't know how to do it," Sanders said. "Developers are calling them regularly." As a result, an estimated 85,000 of Florida's 16.5 million acres of forestland are lost to urban development each year. To maintain private forests, many landowners must find ways to derive income from them.

TERRY & BARBARA GLANCY

Six endangered species have been identified on one of the few patches of pine rocklands left in southern Florida. This tract of land was the third in the state to be certified as a Stewardship Forest.

"Our advice can only go so far," Sanders said. "The landowner must be willing to make compromises, such as extend the rate of return in order to provide for resources." If decisions about a plot are made solely on productivity and merchantability, then the landowner is not going to maintain a species-rich land.

Examples of forest management practices encouraged by the program include single-tree or group selection harvesting. These techniques extract a percentage of carefully chosen trees every 5-10 years, instead of clearcutting the entire stand in one fell swoop, maintaining an uneven-aged, species-diverse forest which in turn benefits wildlife. In addition, when reforesting an area, landowners are encouraged to leave up to 5 percent of the area in mast-producing hardwoods, snags (dead, standing trees) and other types of wildlife cover. Permanent openings in and around the reforestation area also help to create diversity.

The Hollinswood Ranch near Crystal River is a fine example of the harsh reality of the burden that economic needs place on land. One of the largest pieces of property in the program, this extensive ranch must daily produce a monetary return. Its owner relies on cattle, mining, timber, and hunting and fishing leases. Still, he wishes to enhance his property, and the Forest Stewardship Program works with him to do that.

The program provides financial assistance, in addition to the technical, to participating landowners with forests between 25 and 1,000 acres to help offset the costs of implementing conservation practices. Rates vary from 50 to 75 percent of the landowner's out-of-pocket expenses, depending on statewide average costs of given practices.

The more that ecology reveals the intricacies of a landscape, the more apparent it becomes that managing a forest calls for proficiency in many branches of science. If you want a productive, diverse forest on your own property, the Forest Stewardship Program may offer the know-how you need. For more information or to enroll, contact your county forester, a regional office of the Commission, or Scott Sanders at (904) 488-6358.

Janisse Ray is assistant editor of FLORIDA WILDLIFE.

KEEP FLORIDA Beautiful SM

Fishing For A Cleaner Florida

A woman jogging in a city park noticed something struggling in a nearby lake. Approaching the water's edge, she discovered a duck snagged on a valve by a six-pack ring that looped its neck. Though it was February, and the water cold, she swam to the frightened bird, managing to free the duck from the valve but not from the plastic. For a time, the duck was free.

• A hunter, scouting near a river, found a great blue heron, tangled in discarded fishing line, and lifeless.

•In a wildlife refuge, a birder was able to identify the remains of a kingfisher bobbing from the telephone wire, caught in mid-flight by fishing line litter.

Every year, thousands of animals – including birds, turtles and fish – are killed when they become entangled in discarded fishing line, nets, six-pack rings and other trash. In addition, animals die from swallowing smaller pieces of plastic waste like balloons and cigarette butts, which they mistake for food.

The Adopt-a-Shore program of Keep Florida Beautiful has proved to be a popular and effective means of cleaning up natural areas in order to protect wildlife. Under the program, businesses, clubs and community associations adopt one mile of shoreline along any body of water, and remove the litter there three times a year, including the September Coastal Cleanup sponsored by the Center for Marine Conservation, for a minimum of two years.

Since 1991, 384 groups have adopted 467 miles of shoreline and removed 360,000 pounds of debris.

Participants are provided a data card and asked to keep track of findings that help evaluate the source of litter and the health of the shoreline. The information is used by Keep Florida Beautiful to develop solutions to marine debris and litter. Workers are also encouraged to separate recyclables from the trash they collect. The cleanups have shown that a significant portion of the trash and garbage being dumped in our waterways can be traced to boaters and anglers. To combat this, a number of governmental and non-profit conservation organizations developed a Boaters and Anglers' Pledge program, urging Florida's 750,000 recreational boat owners and millions of anglers to make a personal commitment to preserve Florida's waters.

Keep Florida Beautiful, Inc. was created by the Legislature as part of the Solid Waste Management Act as an umbrella organization for community-based environmental programs. In 1993, the Legislature restructured it to function as a working public/private partnership. The organization would coordinate a state media campaign, and statewide litter and marine debris control and prevention programs. Through mass media, environmental education and grassroots programs, Keep Florida Beautiful will help the state reach a mandated 50 percent reduction in litter and marine debris.

BOATERS' AND ANGLERS' PLEDGE

I Pledge:

• to do my part in keeping Florida's beautiful waters free of garbage, trash and other debris.

• to make sure garbage on my boat is stored securely and disposed of properly when I reach shore.

• to remove garbage from Florida's waters and shores, and remember that a clean environment always starts with me.

• to always be an example of the stewardship and pride which Florida boaters and anglers share statewide.

• to encourage fellow boaters, anglers, family and friends to Take The Pledge and help protect Florida's boating environments that have been given to us in trust.

It's The Law

By Inspector Kyle Hill

Question: Is it legal to release domestic mallards into the wild?

No! It is a violation of Florida law to release waterfowl, peacocks, canaries, and other domestic or exotic species into the wild (with the exception of banded mallard ducks, which may be released on licensed hunting preserves).

The Commission requires a game farm license to possess waterfowl. By law, (Chapter 372.16, F.S.) those purchasing or possessing game birds, such as ducks and geese, must secure a game farm license. This allows an individual to operate a private or commercial facility for the protection, preservation, propagation, rearing or production of game birds.

Regulation 39-4.005, Florida Administrative Code, states, "No person shall release or introduce in the state any wildlife, freshwater fish or any other organism that might reasonably be expected to transmit any disease to wildlife or freshwater fish." We consider free-flying domestic waterfowl a threat to our native waterfowl for two primary reasons. First, captive-bred mallards are hybridizing with Florida's native mottled ducks, endangering the species. Second, free-flying domestic ducks can pass on diseases that would decimate our wild ducks in Florida.

Take, for example, the dreaded duck plague, also known as duck virus enteritis (DVE). This wild waterfowl killer recently gained national attention in California. That state's Department of Fish and Game ordered the destruction of the infected ducks because the exposed birds were a threat to wild waterfowl populations. Surviving ducks can be long-term virus carriers, and there is no reliable way to detect disease in waterfowl that have "silent" infections.

The Southeastern Cooperative Wildlife Disease Study (SCWDS) reports that, so far, 67 outbreaks of DVE in the United States have been documented. In May 1993, authorities confirmed the disease in feral waterfowl on a 33-acre lake in Ft. Jackson, South Carolina. The South Carolina Wildlife and Marine Resources Department, working with the SCWDS, depopulated the birds in early June. A massive outbreak in South Dakota in 1973 killed about 43,000 wild ducks and 250 Canada geese.

Unfortunately, muscovy ducks as well as domestic mallards are highly susceptible to infection. Muscovies, however, usually become very ill and die, while mallards and other species may survive and shed the virus intermittently for up to five years following infection. Since vaccination is not practical or effective, depopulation is the only failproof method of dealing with exposed feral ducks in order to protect wild waterfowl. SCWDS recommends removing all exposed ducks and their eggs from the affected area, treating the area with a disinfectant, and draining impounded water.

Experts believe that it is just a matter of time before Florida must deal with duck plague. Thousands of captive-bred mallards can now be found on ponds, lakes and canals where they have been illegally released. You can help save our native waterfowl by following these steps:

- If you have domestic mallards or muscovy ducks on state waters (all natural lakes and rivers are state property), retrieve them and keep them on your own property. This may require fencing, wing clipping or pinioning.

- Apply for a game farm license from this agency if you own mallards or other waterfowl, so you will receive the information necessary for safeguarding our native mottled ducks. The license costs only $5.00 per year.

- Let others know the dangers that free-flying captive waterfowl pose to native wildlife.

Public Shooting Ranges

By Captain Ed Tyer

Almost daily hunters and other shooters call the Commission seeking safe places to shoot. In addition, all hunter education students require a safe place to shoot a rifle, shotgun and bow satisfactorily in order to complete our hunter education course.

The availability of federal assistance, combined with the need for public shooting ranges, has provided the impetus for state-sponsored construction of ranges. In 1970 the Pittman-Robertson Act, which in 1937 levied an excise tax on sporting arms and ammunition for wildlife restoration, was amended to provide funding for hunter safety training and range construction. This funding, available to states on a 75:25 ratio, is administered through the U.S. Fish and Wildlife Service. Through the use of in-kind services and other donations, the hunter education ranges constructed to date have cost the state nothing. Only citizens who purchase firearms and ammunition contribute financially to these projects.

Currently, five public ranges are in operation in Florida, with a sixth, Tenoroc, under contract for construction. A brief synopsis of the ranges and our future plans follows:

OSCEOLA NATIONAL FOREST SHOOTING RANGE

The Osceola National Forest Range, a cooperative project of the Commission and the U.S. Forest Service, is located in Columbia County.

The facility includes a 10-position, 200-yard range; two 50-yard pistol ranges of 15 positions each; and a 40' x 40' building used for training and meetings. Shotgun shooting is not allowed. This facility, which is accessible to mobility-impaired shooters, is open to the public during daylight hours free of charge. For further information contact the Commission's regional office in Lake City.

APALACHICOLA NATIONAL FOREST SHOOTING RANGE

Located in Leon County on Forest Road 305, this range is a cooperative project of the Commission and the U.S. Forest Service. The facility consists of a 12-position, combination rifle and pistol range with accommodations for targets at 15, 25, 50 and 100 yards. Shotgun shooting is not allowed. The range offers a covered shooting shed and concrete walks to the target stands, making it readily accessible to the mobility-impaired shooter. Open during daylight hours, no user fee is charged. For further information please contact the Commission's regional office in Panama City.

OCALA NATIONAL FOREST SHOOTING RANGE

The Ocala range, located in Marion County on Forest Road 88, is also a cooperative project of the Commission and the U.S. Forest Service. It is identical to the Apalachicola range except that an area for shotgun shooting has been added. There shotgunners can shoot at clay targets, but must provide the target throwers. For additional information please contact the Commission's regional office in Ocala.

CECIL WEBB WILDLIFE MANAGEMENT AREA SHOOTING RANGE

This range is located in Charlotte County, approximately one mile from the main gate of the Cecil Webb Wildlife Management Area. The facility consists of a 12-position, 50-yard pistol range; a five-position, 200-yard, high-powered rifle range; and a shotgun shooting area. It is open during daylight hours with no fee required. Additional information on this range may be obtained from the Commission's regional office in Lakeland.

CHAMPION INTERNATIONAL RANGE

The Champion International Shooting range is located in Santa Rosa County on land donated by Champion International Corporation. The range site is approximately one-quarter mile east of the Escambia River on Highway 184.

This is our newest and first full-service range offering shooting opportunities for most types of firearms and archery equipment. The grand opening was held January 22.

The facility consists of an 8-position, 100-yard rifle range; a 12-position, 50-yard pistol range; two shotgun shooting pads; an elevated, handicapped-accessible archery range; and a sporting clays range.

The concessionaire which maintains this facility charges shooters $3 a day or $30 for an annual use permit. Fees for the 25-round (25-shot) sporting clays range is $8. The concessionaire also operates a pro shop where ammunition, guns and associated shooting supplies may be purchased. Additional information may be obtained by contacting the range at (904) 995-0003.

TENOROC SHOOTING RANGE (planned)

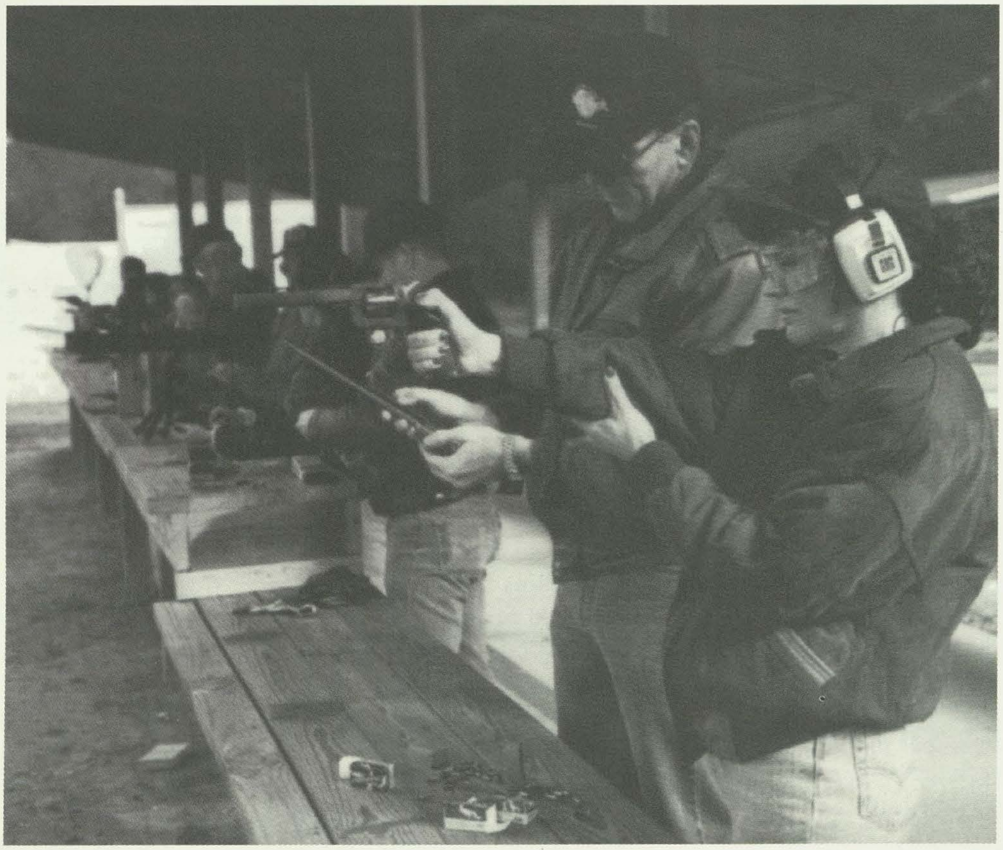
The Tenoroc range will be located in Polk County on the north side of Lakeland. With close access to I-4 and about a 30-minute drive from Orlando or Tampa, this facility will serve a very large population. Construction is scheduled to begin soon.

Plans include a 15-yard, 25-position range; a 25/50 yard, 15-position range; a 50/100 yard, 24-position range; a handicapped-accessible archery range; two shotgun shooting pads; an airgun range and sporting clays.

An office, storage areas and restrooms are also planned. For more information on this range please contact the Commission's regional office in Lakeland.

MARKHAM PARK REGIONAL SHOOTING RANGE

This public range in Broward County was built through state funding by the Commission and leased back to the county. The facility consists of a 50-yard range with 44-positions; a 100-yard range with 66-positions; four trap and skeet fields; one trap-only field and a sporting clays range. For additional information please contact the range at (305) 389-2005.



GFC

Floridana

Phil Phillips: Writing History in the Sky

"Phil Phillips was a spinner of tall tales and the trouble of it was that most of them were true."

– Jerry Banks, Assistant Director 1981-86

When Phil Phillips, who flew B-17s during World War II, went looking for a job after the war ended, he came to Florida. Though a native of Arkansas, he had fallen in love with the state while stationed here, and wanted to return. He called on the Florida Game and Fresh Water Fish Commission, whose aviation section was newly off the ground, with five pilots flying surplus military aircraft. Phillips was told that another pilot would be hired only if one of the pilots died in a crash or quit. Not six months later, in 1952, a spray pilot died in a crash on Lake Okeechobee. Phillips replaced him.

Reggie Tower was chief pilot at the time. Every day he would climb to 5,000 feet and call the name of each wildlife officer in the area, asking him his whereabouts and present activity. One morning Tower was going through the roll when Charlie Clymore, then assistant director, picked up the microphone and began singing, "When the roll is called up yonder..." That broke everyone up, Phillips remembers.

In those days, the Commission relied heavily on chemicals for control of water hyacinth and other exotic aquatic weeds. Television and radio stations flocked to cover spraying operations – the people were happy to be rid of the noxious weeds that impair fishing opportunities.

But after *Silent Spring* was published in 1962, attitudes changed. Where Phillips had been greeted with open arms and baskets of fruit by residents, and feted with dinners by local politicians, now he was met with baseball bats and shaking fists. Eventually, the Commission stopped spraying for aquatic weed eradication.

In addition to spraying and surveying, Phillips flew fire-hunting searches at night for law enforcement and rescue missions throughout the state. On one occasion, he remembers, it took him about three hours flying over the Loxahatchee to locate two anglers who had been lost for several days. He often flew in grid formation over Lake Okeechobee looking for the bodies of drowned fishermen.

About 1955, between Perry and St. Marks, Phillips was taking a post-season survey of waterfowl in a PA 18. Duck season had been closed two weeks and he spotted a poacher with a couple of dozen goose decoys. The man was in a cove, blinded by the trees, so Phillips rolled the plane down and flew over the spot. On his second pass, the poacher shot at him, hitting the aircraft body and propeller, but causing little damage. He flew up to 1,000 feet and radioed the location to ground patrol, but the man was able to evade capture.

On one occasion, he left St. Petersburg for Williston, flying north along U.S. 19. About New Port Richey, the oil line erupted and he quickly lost power. He called a "mayday" – he was going down and would attempt to land on the highway. Phillips started down but the motorists would not give way. He swung out over the swamp with the engine getting really ragged, realizing he would have only one more attempt to land before the engine seized. He tightened his harness, determined to land, and started down. One car kept coming! Already committed, Phillips waited until the car was about 200 feet in front of him when he shoved the stick forward, causing the plane to bounce down and then up from the highway, just clearing the car. Then he made a clean landing.

The driver, (a schoolteacher, he later found out) stopped, turned around and drove back to the plane. "Is something the matter?" she asked him in alarm.

"All's well that ends well," he said.

Another time Phillips put a PA 25 in Lake Henderson. The gas tank he had filled the night before would give him almost three hours of spray time. Instead, he had 23 minutes. It turns out that, during the night, a vandal siphoned most of the gas out of the tank and, in the process, broke the fuel gauge on full.

Phillips was pulling around to make a spraying pass about 150 feet up when the engine sputtered and quit. He tried for one restart and then realized he was going in. He trimmed the flaps to slow the plane and tightened his harness and hard hat.

The wheels struck the water first and the plane flipped over on its back. A 6-inch ventilator over his head became a 6-inch irrigation pipe, quickly filling the cockpit with water. Phillips managed to uncouple his harness and float up to where his feet had been, where a little air remained. When the water pressure equalized, he swam down and out through the door to escape.

Two fishermen in the adjacent Little Lake Henderson came to his rescue. Looking around, they realized that eight other boats, full of people fishing the bream beds, were in the immediate area when the plane went down. When approached about their lack of action, the anglers gave various responses, but one confounded everyone: "Captain, I saw him go in the water over there. We didn't know anything was wrong; we thought it was one of those airplanes supposed to land in the water like that!"

Phillips survived, and since the empty gas tank and chemical hopper acted as corks, the plane didn't sink. Less than $150 damage was done to the aircraft.

In 23 years with the Commission Phillips hit eight sets of power lines. The most harrowing of those experiences happened in a canal near Puzzle Lake in Lake Wales about 1967. On a Friday, returning from spraying duty, he surveyed the canal for obstructions. Over the weekend, however, workers extended power lines across the canal to the site of a house under construction. Several days later, quitting spraying for the day, Phillips caught sight of the wires a split second before he hit them. Because there were three, the plane seemed to hang in midair for a second before it broke through. The windshield was destroyed, along with half the fabric on the right wing. After Phillips calmed down, he called a "mayday" to Lakeland. The plane would only fly at full throttle and with the stick forward left to compensate for the wing damage. Although more wing damage occurred en route, Phillips managed to land in Lakeland 20 minutes later.

Note: The Commission currently maintains an aviation section with eight pilots who supplement law enforcement with aerial observation over large land tracts, and collect wildlife research data, including surveys on endangered and threatened species. In addition, the pilots assist with aerial ignition of burn plots, search and rescue, disaster assistance, and domestic marijuana eradication.

– Janisse Ray

This column currently features colorful, retired Commission employees. The information is derived from oral histories and other archival sources.

Conservation Update

Compiled by Janisse Ray

YOUTH CONSERVATION SUMMER CAMPS

For over 35 years the Commission has conducted action-packed, well-staffed summer adventures for children ages 8 to 14. One-week camp sessions are scheduled from June 19 through August 13. Registration is $135 per child, which includes meals, lodging and materials.

The two youth conservation camps are located in scenic, remote areas. The Ocala camp sits on Lake Eaton, in the Ocala National Forest. The Everglades camp is near West Palm Beach, in the Hungryland Slough of the J.W. Corbett Wildlife Management Area.

Your children can enjoy camping, canoeing, fishing, swimming, archery, nature hikes and other fun-filled activities this summer. Campers learn about the interdependency of wildlife and habitat, and participate in outdoor adventures that make conservation concepts relevant to their lives. Programs include Nature Seekers, Wild About Wildlife, Expedition, and Wildlife Conservation and Firearms Safety.

Registration is limited to 90 campers at the Everglades camp and 107 at the Ocala site. These fill early. To reserve a spot, contact the Florida Game and Fresh Water Fish Commission, 620 S. Meridian Street, Tallahassee, FL 32399-1600, telephone: (904) 488-4676.

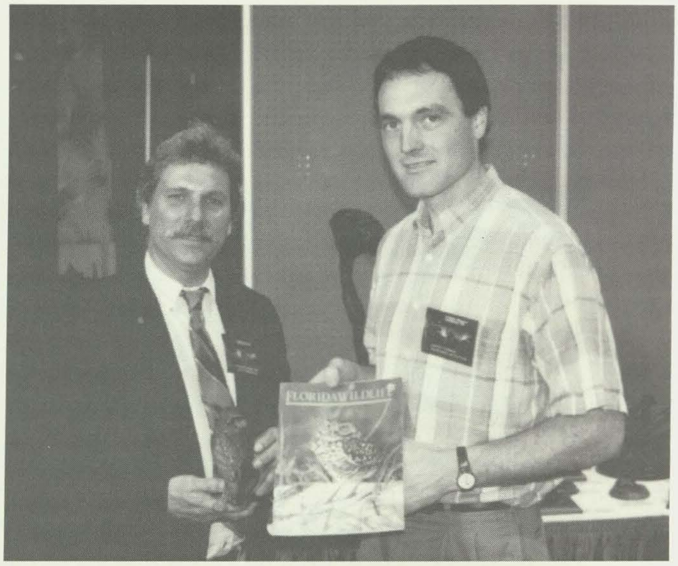
ANTLERS MUST GROW

In March the Commission approved a new minimum length for antlers of deer taken during hunting seasons. Effective next fall, bucks must have at least one antler at least five inches long. Current regulations require that deer have at least one antler with a minimum length of one inch visible above the hairline.

Numerous hunt clubs have endorsed the new rule in hopes it might improve the quality of deer hunting in Florida.

PROJECT WILD NUMBER CHANGES

Project WILD, the environmental education program for classroom teachers operated by the Commission's Office of Informational Services, now has a separate telephone line. You may contact Tim Roach, statewide Project WILD coordinator, directly at (904) 488-4679.



Tim Roach, Florida's Project WILD coordinator, and David Turner, a nationally acclaimed wildlife sculptor, show off the bronze burrowing owl, a fund-raiser for Florida's Project WILD Action Grant Program, at the Florida Wildlife Exposition held in Orlando in February.

OWL SCULPTURE FUNDS SCHOOLYARD HABITAT RESTORATION

The beautiful, 6-inch, bronze sculpture of the burrowing owl, a limited-edition piece of art that helps provide funds to classroom teachers for schoolyard habitat projects, is still available from David Turner, renowned wildlife sculptor. Forty percent of the purchase price of each sculpture goes directly into the Project WILD Action Grant Program, which awards grants to Florida classroom teachers for habitat restoration and enhancement on school campuses. The program is jointly administered by the Commission and the Florida Wildlife Federation.

In the 1993-94 funding cycle, the program recently awarded $4,600 in matching-fund grants for 13 proposals that range from reconstruction of a clayhill high pine ecosystem at a Tallahassee elementary school to creation of a bird sanctuary on a Fort Lauderdale elementary campus.

Each burrowing owl sculpture costs $350. Of this amount, $140 is directed into the Action Grant Program; the remaining $210 covers production and shipping costs. Each piece sold includes a certificate of authenticity and a letter confirming your contribution to the program.

Order your signed and numbered burrowing owl sculpture from Turner Sculpture, Box 128, Onley, VA 23418. For credit card orders call: (804) 787-2818.

WHO'S WHO IN CONSERVATION

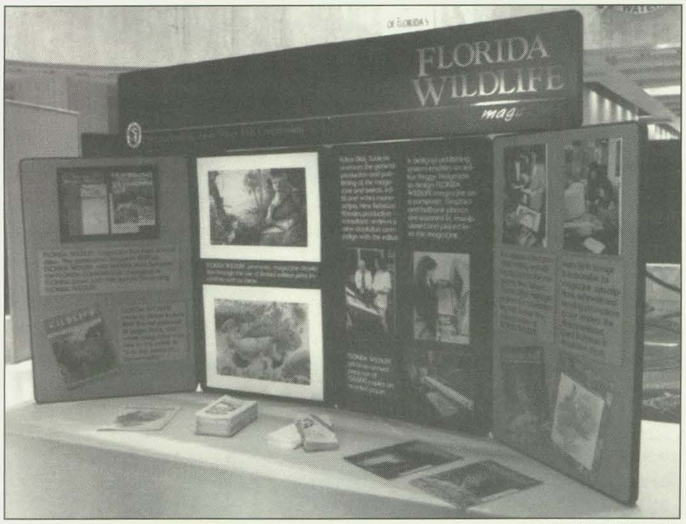
The 1994 Conservation Directory, the nation's most comprehensive listing of organizations, agencies and officials involved in natural resource use and management, is now available. It is published annually by the National Wildlife Federation.

The directory can be purchased for $20 plus shipping and handling from the Federation, 1-800-432-6564, item #79561.

HAVE EXHIBIT, WILL TRAVEL

FLORIDA WILDLIFE magazine has put together a traveling exhibit that is available on loan for conferences, expositions and other events. The display has been shown recently at the State Capitol, Florida State Fair and Florida Academy of Sciences conference.

If you are interested in hosting this exhibit, contact the editors of the magazine at (904) 488-5563.



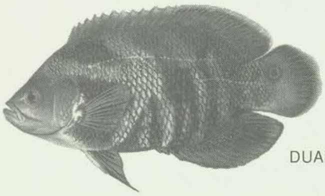
P. PERKERSON

WILL YOU FISH FOR THE NEXT FIVE YEARS?

If you annually purchase a Florida freshwater fishing license, you may want to consider biting at a bait the Florida Game and Fresh Water Fish Commission is throwing out to you – a five-year license instead.

Besides money, a five-year license saves you the time it takes every year to go out and buy a new license. The extended license is more durable, made like a plastic credit card.

A five-year license, available to Florida residents only, can be purchased for $60 from county tax collectors' offices.



DUANE RAVER

RECORD OSCAR CAUGHT IN OKEECHOBEE

Jimmy Cook of Loxahatchee established a new Florida record for oscar on March 16. He landed the 2.34-pound fish from Lake Okeechobee in Palm Beach County.

According to Commission biologist Frank Morello, who verified the fish, the oscar measured 12.50 inches long and had a girth of 13 inches. Cook's oscar exceeded the previous record of 1.79 pounds.

The oscar is a native of South America which has become established in southern Florida.

FORESTRY CAMP FOR KIDS

Middle school students may now enroll in the summer program, "Florida's Forests and Environmental Education," sponsored by the Florida Department of Agriculture and Consumer Services' Division of Forestry.

Now in its fourth year, the camp will be held at the Withlacoochee Environmental Center near Brooksville. Teachers, who first participate in a week-long training workshop, work directly with the students.

The fee for the program is $180. Weekly sessions run June 26 through August 6. For more information, or to register, contact Gene Madden at (904) 754-6780, or your local county forester.

Wildlife Alert

CALL TOLL FREE

Panama City	1-800-342-1676
Lake City	1-800-342-8105
Ocala	1-800-342-9620
Lakeland	1-800-282-8002
West Palm Beach	1-800-432-2046

Report Wildlife Law Violators!

REGIONAL OFFICES
Florida Game & Fresh Water Fish Commission

Northwest Region
3911 Hwy . 2321
Panama City, FL 32409-1658
Telephone: (904) 265-3676

Northeast Region
Route 7, Box 440
Lake City, FL 32055-8713
Telephone: (904) 758-0525

Central Region
1239 S.W. 10th Street
Ocala, FL 34474-2797
Telephone: (904) 732-1225

South Region
3900 Drane Field Road
Lakeland, FL 33811-1299
Telephone: (813) 648-3203

Everglades Region
551 North Military Trail
West Palm Beach, FL 33415-1396
Telephone: (407) 640-6100

TDD: (904) 488-9542

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Planning Your Summer Vacation?

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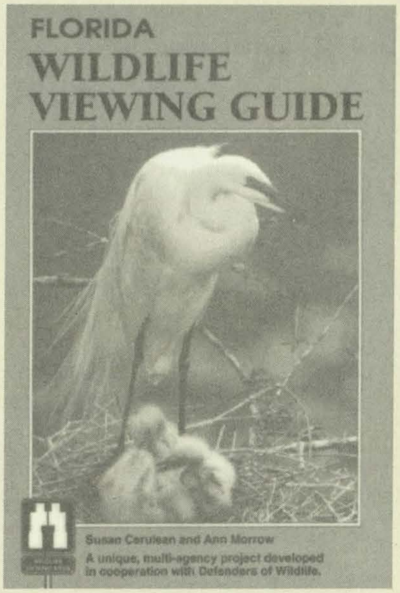
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